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ABSTRACT

New legislation in 1972 shifted the emphasis of the California Assessment Program (CAP) from traditional every pupil achievement testing to a more efficient multiple-matrix testing design, under which a broad spectrum of skills could be surveyed without undue expenditure of educational resources. Scale score reporting was introduced to the grade 6 assessment in 1981-82. The purpose of the present report is to document activities undertaken in this endeavor. After a brief review of the fundamentals of CAP measurement models, the following topics are considered: (1) structure of the assessment instrument and the delineation of skill areas; (2) item calibration procedures and results; (3) scoring procedures for a single school in a single skill element, then for aggregations of schools and/or skill elements; (4) method of approximating results for demographic subgroups within schools; and (5) equating of results from the prior grade 6 surveys to the new score scale. Appendices include (1) Calibration of Skill Element "Classification of Numbers": One- and Two-Parameter Logistic Models; and (2) 1981-82 Grade 6 Item Parameter Estimates. (LMO)

A Technical Description of the Procedures Used in Calculating School-Level Scaled Scores for the *Survey of Basic Skills: Grade 6*

California Assessment Program

CALIFORNIA STATE DEPARTMENT OF EDUCATION
Bill Honig, Superintendent of Public Instruction
Sacramento, 1984

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PREFACE

To provide feedback on educational programs to state and local educators as well as to the public at large, California has by law required statewide testing in one form or another since 1961. New legislation in 1972 shifted the emphasis of the California Assessment Program (CAP) from traditional every pupil achievement testing to a more efficient multiple-matrix testing design, under which a broad spectrum of skills could be surveyed without undue expenditure of educational resources. The essence of the CAP design is to administer to each pupil in specified grade levels a sample of but one or two items each from a variety of skill areas. Scores for individual pupils in these detailed areas are neither desired nor computed; rather, precise measurements of the average levels of attainment in larger units such as schools, districts, counties, and the state as a whole are obtained.

The 1979-80 grade 3 assessment marked another milestone in the evolution of CAP, as results were reported for the first time in terms of scale scores as well as the more familiar percent correct and percentile indices. The item response model upon which CAP scale scores are based facilitates comparisons among skill areas, provides for content referenced interpretation of scores, and permits the item bank to be updated without disruption of trend lines of results.

Scale score reporting was introduced to the grade 6 assessment in 1981-82. The purpose of the present report is to document activities undertaken in this endeavor. After briefly reviewing the fundamentals of the CAP measurement model, we consider the following topics:

- The structure of the assessment instrument and the delineation of skill areas;
- Item calibration procedures and results;

- Scoring procedures for a single school in a single skill element, then for aggregations of schools and/or skill elements;
- Method of approximating results for demographic subgroups within schools;
- Equating of results from the prior grade 6 surveys to the new score scale.

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BACKGROUND

The components of the 1981-82 grade 6 California assessment are the population of interest, namely the public schools with sixth-grade pupils in the state of California; the assessment instrument and the delineation of skills around which it was constructed; and the measurement model through which CAP scale scores are defined. These components are described in this section.

The Population

All California public schools containing grade 6 pupils were surveyed in the 1981-82 assessment. Sampling of pupils within schools was exhaustive; that is, every pupil was administered one randomly selected test form of the forty that comprised the grade 6 assessment instrument (see below). Pupils were omitted from reporting if they were unable to respond to the survey because of mental or physical handicaps or if they could not interact meaningfully with the English language instrument.

Surveys were conducted in the spring quarter of the 1981-82 school year. Local educational authorities, mainly school principals, were responsible for returning completed surveys to Educational Testing Service (ETS) for optical scanning. ETS proceeded with the processing of percent-correct results and the summarization of results for schools, in terms of schools' numbers of attempts and correct responses to each assessment exercise. This summary file was forwarded to International Educational Services for item calibration and scale score estimation. A total of 4,084 schools were included in the file, summarizing responses from 293,281 pupils.

The Assessment Instrument

Statewide testing in California is intended not only to monitor attainment in the schools but to provide results at a level of detail sufficient to guide improvement. In particular, results must be reported at the level of detail at which allocations of educational resources may vary from one curriculum to another, so that the specific strengths, weaknesses, and trade-offs of alternative programs can be examined. To this end, CAP has retained the services of teachers, principals, and content area specialists throughout the state to develop the framework upon which the assessment instruments are built, namely, the specification of the hierarchies of skills in reading, mathematics, and written language as they are taught in the sixth grade classrooms of California. Figures 1, 2, and 3 show the specifications of skills in written language, mathematics, and reading, respectively.

The skills at the lowest levels of these hierarchies are called "skill elements" and are intended to be defined sufficiently narrowly so that a major shift in curricular emphasis will have essentially the same effect on all the items in an element. In written language, for example, spelling of words that follow phonetic rules ("predictable words") is represented by one element and spelling of words that violate phonetic rules ("spelling demons") is represented by a different element, since these skills may well be emphasized to different degrees in different spelling programs. It is at the level of skill elements that the CAP measurement model (see below) is defined. There are 40 elements in reading, 33 in mathematics, and 29 in written language. Results for skills at higher levels in the hierarchy are simply averages over results in the elements that comprise them. Further details on the specification of skills, including sample test items, can be found in the CAP publication Survey of Basic Skills: Grade 6--Rationale and Content (Sacramento: California State Department of Education, 1982).

FIGURE 1

WRITTEN LANGUAGE REPORTING CATEGORIES

I. WRITING PROCESS SKILLS

A. JUDGING STUDENT WRITING

B. PARAGRAPHS

1. TOPIC SENTENCES
2. DETAILS AND SEQUENCE
3. OUTLINES FOR ORGANIZATION
4. VERB TENSE & PRONOUN USAGE

C. SENTENCE COMBINING

1. SIMPLE SENTENCES WITH MODIFICATION
2. COMPOUND SENTENCES
3. COMPLEX SENTENCES
4. CONJUNCTIONS

D. SENTENCE RECOGNITION

1. SUPPLYING SUBJECTS
2. SUPPLYING PREDICATES
3. FORMING COMPLETE SENTENCES

E. LANGUAGE CHOICES

1. SENSORY WORDS
2. SPECIFIC WORDS & SENTENCES
3. ACHIEVING TONE

II. SUPPORTING SKILLS

A. STANDARD ENGLISH USAGE

1. IRREGULAR VERBS
2. PRONOUNS
3. SUBJECT-VERB AGREEMENT
4. NOUN DETERMINERS
5. DOUBLE NEGATIVES

B. WORD FORMS

1. SUFFIXES
2. IRREGULAR NOUN PLURALS
3. CONTRACTIONS

C. SPELLING

1. PREDICTABLE WORDS
2. WORDS WITH SUFFIXES
3. DEMONS
4. HOMOPHONES

D. CAPITALIZATION AND PUNCTUATION

1. CAPITALIZATION
2. PUNCTUATION

FIGURE 2

MATHEMATICS REPORTING CATEGORIES

I. COUNTING, NUMERATION, & PLACE VALUE

- A. SKILLS
  - 1. COUNTING AND NUMERATION
  - 2. PLACE VALUE
- B. APPLICATIONS

II. NATURE OF NUMBERS & PROPERTIES

- A. SKILLS
  - 1. ORDERING AND PROPERTIES
  - 2. CLASSIFATION OF NUMBERS
- B. APPLICATIONS

III. OPERATIONS

- A. SKILLS
  - 1. ADD/SUBTRACT WHOLE NUMBERS
  - 2. MULTIPLY WHOLE NUMBERS
  - 3. DIVIDE WHOLE NUMBERS
  - 4. ADD/SUBTRACT DECIMAL NUMBERS
  - 5. MULTIPLY/DIVIDE DECIMAL NUMBERS
  - 6. OPERATIONS ON FRACTIONS
  - 7. PERCENTS AND EQUIVALENT FRACTIONS
- B. APPLICATIONS
  - 1. ONE STEP, WITH WHOLE NUMBERS
  - 2. ONE STEP, WITH RATIONAL NUMBERS
  - 3. TWO OR MORE STEPS

IV. EXPRESSIONS, EQUATIONS, GRAPHS

- A. SKILLS
  - 1. EXPRESSIONS AND EQUATIONS
  - 2. GRAPHS AND FUNCTION TABLES
- B. APPLICATIONS

V. GEOMETRY

- A. SKILLS
  - 1. SHAPES AND TERMINOLOGY
  - 2 RELATIONSHIPS
- B. APPLICATIONS

VI. MEASUREMENT

- A. SKILLS
  - 1. METRIC UNITS
  - 2. US UNITS
  - 3. LENGTH, AREA, AND VOLUME
- B. APPLICATIONS

VII. PROBABILITY AND STATISTICS

- A. PROBABILITY
- B. STATISTICS

VIII. TABLES, GRAPHS, APPLICATIONS

- A. TABLES AND GRAPHS
- B. INTEGRATED APPLICATIONS

IX. PROBLEM SOLVING

- A. FORMULATION
- B. ANALYSIS AND STRATEGY
- C. INTERPRETATION
- D. SOLUTION OF PROBLEMS

FIGURE 3

READING REPORTING CATEGORIES

I. VOCABULARY

- A. PREFIXES, ROOTS, SUFFIXES
- B. WORD MEANINGS
- C. USING CONTEXT WITH MULTIPLE-MEANING WORDS

II. COMPREHENSION

- A. LITERAL
  - 1. DETAILS
    - a. FROM A SINGLE SENTENCE
    - b. FROM TWO OR MORE SENTENCES
  - 2. PRONOUN REFERENCES
  - 3. SEQUENCE
- B. INFERENTIAL
  - 1. MAIN IDEAS
  - 2. CAUSE-EFFECT
  - 3. FOLLOWING ORGANIZATION
  - 4. PUTTING INFORMATION TOGETHER
  - 5. PREDICTING OUTCOMES
  - 6. COMPARISONS AND CONTRASTS
  - 7. DRAWING CONCLUSIONS FROM DETAILS
  - 8. CONCLUSIONS FROM OVERALL MEANING
- C. INTERPRETIVE
  - 1. ANALYZING CHARACTER
  - 2. IDENTIFYING SETTING
  - 3. SUMMARIZING PLOT
  - 4. UNDERSTANDING DIALOGUE
  - 5. SENSING MOOD
  - 6. UNDERSTANDING FIGURATIVE LANGUAGE
- D. CRITICAL/APPLICATIVE
  - 1. DETECTING AUTHOR'S ATTITUDE
  - 2. DETECTING AUTHOR'S PURPOSE
  - 3. SEPARATING FACT FROM OPINION
  - 4. APPLICATIONS TO DIFFERENT CONTEXT

III. STUDY-LOCATIONAL SKILLS

- A. REFERENCE MATERIALS & PARTS OF BOOK
- B. MAPS, GRAPHS, AND CHARTS

READING IN THE CONTENT AREAS

I. WORD MEANING

- A. GENERAL
- B. IN SCIENCE
- C. IN SOCIAL STUDIES

II. COMPREHENSION OF LITERATURE PASSAGES

- A. LITERAL
- B. INFERENTIAL
- C. INTERPRETIVE
- D. CRITICAL

III. COMPREHENSION OF SCIENCE PASSAGES

- A. LITERAL
- B. INFERENTIAL
- C. CRITICAL

IV. COMPREHENSION OF SOCIAL STUDIES

- A. LITERAL
- B. INFERENTIAL
- C. INTERPRETIVE
- D. CRITICAL

The grade 6 assessment instrument consists of forty distinct forms, one of which is assigned at random to each pupil. Each form consists of thirty exercises, all of which (with the exception discussed below) represent different skill elements. This design both guarantees maximally efficient estimates of school means for a given number of responses to items in an element and ensures the independence of responses to items in an element within schools, given the average level of attainment of the school.

The exception to this design occurs in the reading content area, where a two-way classification exists for many items. Skill elements are defined in accordance with increasingly specific skills, as in the mathematics and written language content areas; but eleven elements are also defined in accordance with the topic of a passage (literature, science, or social science) at a skill level just above that of reading skill elements. Pupils participating in the survey of these eleven elements provide an average of two and one-half responses in such an element rather than just one.

The CAP Measurement Model

The measurement model for CAP scale scores is based on item response theory. The heart of the model is a mathematical expression for the probability that a pupil selected at random from a given school will respond correctly to a given item representing a given skill element; that is,

$$P_{ij} = \exp[(\theta_i - \beta_j)/\sigma_j]/(1+\exp[(\theta_i - \beta_j)/\sigma_j]) \quad (1)$$
$$= \Psi[(\theta_i - \beta_j)/\sigma_j].$$

where

P_{ij} represents the probability of a correct rather than incorrect response to item j from a pupil selected at random from school i,

θ_i is the scale score of school i, representing the average level of attainment of pupils in the school in the skill element of interest,

β_j is the "threshold" parameter of item j, or the scale score required for 50-50 chances of a correct response, and

σ_j is the "dispersion" parameter of item j, a value inversely proportional to the reliability with which item j measures attainment in the skill element.

Under the usual CAP item-sampling design in which a pupil responds to only one item from a given element, the probability of a school's pattern of numbers of correct attempts to the items in a particular element, say $\underline{R}_i = (R_{i1}, R_{i2}, \ldots,)$ given the total numbers of attempts to those items, say, $\underline{N}_i = (N_{i1}, N_{i2}, \ldots,)$ is given as

$$P(\underline{R}_i \mid \underline{N}_i, \theta_i, \underline{\beta}, \underline{\sigma}) = \prod_j P_{ij}^{R_{ij}} (1-P_{ij})^{N_{ij} - R_{ij}} \qquad (2)$$

This expression forms the foundation for the practical application of the measurement model, the two steps consisting of calibrating the items in an element (i.e., estimating their parameters) from the responses of a large sample of schools, then estimating scale scores for all schools with the item parameter estimates considered known quantities. (Equation 2 is employed in item calibration and score estimation in the eleven reading elements mentioned above, wherein a pupil might sometimes provide more than one response to items in the same element; under the assumptions of Equation 1, the resulting item and school score estimates are consistent but standard errors of estimation would tend to be slightly too small.)

Further information about the features and the benefits of the CAP measurement model may be found in Bock and Mislevy (1981) and Bock, Mislevy, and Woodson (1982). For a more technical discussion of item response models for grouped data in general, including relationships between group-level and individual-level item response models, see Mislevy (1983).

ITEM CALIBRATION

So that the schedule calling for item calibration and scoring of 1981-81 results during the summer of 1982 might be adhered to, items within each of the 102 grade 6 skill elements were calibrated on the basis of the responses of a random sample of 1063 of approximately 3000 of the first schools to return survey forms to ETS. Responses from over 65,000 pupils are represented in this data base; approximately 1650 responses are secured for each item. In this section, we outline the procedures employed to calibrate items and summarize the results.

Calibration Procedures

Calibration was carried out separately for each skill element, with procedures based on the marginal maximum likelihood (MML) approach introduced by Bock and Aitkin (1981). This approach differs from the so-called "fixed-effects" approach employed in the 1979-80 calibration of the grade 3 assessment (see Bock and Mislevy, 1981) by removing the need to estimate the scale scores of individual schools in the course of item calibration; expressions characterizing population densities and probabilities of correct item responses across the attainment scale are instead employed. As these latter quantities are estimated with much greater accuracy than school scores, the stability of item parameter estimates is enhanced. An outline of the MML algorithm follows.

Estimation begins with assumption that responses to all items in an element from pupils in all schools are in accordance with [1], the CAP measurement model. It is further assumed in the current application that the distribution of school scale scores in the calibration sample is approximately normal. It need <u>not</u> be further assumed that the calibration sample is a random sample of the population, that it has the same mean or variance as the

population, or that the population itself is normal. Two constraints must be imposed on the scale to resolve indeterminacies of scale and origin in [1]. A provisional scaling is accomplished by fixing the mean and variance of the calibration sample at one and zero, respectively. The final fixing of the origin and unit-size of the scale will also be described.

Under these assumptions, the marginal probability of observing the vector of correct attempts $\underline{R}$ from a school in the calibration sample, given its vector of total attempts $\underline{N}$, is obtained as

$$h(\underline{R}) = \text{Prob}(\underline{R}|\underline{N}, \underline{\beta}, \underline{\sigma})$$

$$= \int_{\theta} p(\underline{R}|\theta)\, \phi(\theta)\, d\theta, \tag{3}$$

where

ϕ is the standard normal density function

and

$$p(\underline{R}|\theta) = \prod_{j} \frac{N_j!}{R_j!\,(N_j - R_j)!} P_j(\theta)^{R_j} (1-P_j(\theta))^{N_j - R_j} \tag{4}$$

with

$$P_j(\theta) = \text{Prob}(x_j = 1 | \beta_j, \sigma_j, \theta)$$

Inasmuch as closed-form expressions do not exist for the integration required in [3], it is standard practice to substitute Gauss-Hermite quadrature (see Sechrest and Stroud, 1966). Let X_k and $A(X_k)$, for k=1,q, be tabled quadrature points and weights for approximating integration over the normal density. (Ten points have been employed in the current application.) Then $h(\underline{R})$ is approximated as follows:

$$h(\underline{R}) \sim \sum_{k} p(\underline{R}|X_k)\, A(X_k).$$

The log marginal likelihood of the entire calibration data is then

$$L = \sum_i \log h(\underline{R}_i)$$

$$= \sum_i \log \sum_k p(\underline{R}_i|X_k)\, A(X_k). \qquad (5)$$

MML estimates of $\underline{\beta}$ and $\underline{\sigma}$ are the values that maximize [5].

It is computationally convenient to rewrite the measurement model in terms of item slopes (a_j) and intercepts (c_j) rather than thresholds and dispersions. The defining relationships are

$$c_j = \beta_j/\sigma_j$$

$$a_j = 1/\sigma_j,$$

so that

$$P_j(\theta) = \Psi[(\theta_j-\beta_j)/\sigma_j] = \Psi(a_j\theta-c_j).$$

Maximization of [5] then proceeds by differentiating with respect to each a_j and c_j, then equating the results to zero to produce the likelihood equations. Beginning with intercepts,

$$\frac{dL}{dc_j} = \sum_i h^{-1}(\underline{R}_i) \sum_k \frac{dp(\underline{R}_i|X_k)}{dc_j} A(X_k)$$

$$= \sum_i h^{-1}(\underline{R}_i) \sum_k p(\underline{R}_i|X_k) \frac{R_{ij} - N_{ij} P_{ij}(X_k)}{P_j(X_k)[1-P_j(X_k)]} \frac{dP_j(X_k)}{dc_j} A(X_k)$$

$$= -\sum_i h^{-1}(\underline{R}_i) \sum_k p(\underline{R}_i|X_k) [R_{ij}-N_{ij}P_{ij}(X_k)] A(X_k)$$

$$= -\sum_k [\sum_i R_{ij} h^{-1}(\underline{R}_i) p(\underline{R}_i|X_k)A(X_k)$$

$$- P_j(X_k)\sum_i R_{ij} h^{-1}(\underline{R}_i)p(\underline{R}_i|X_k)A(X_k)]$$

$$= -\sum_k [\sum_i R_{ij} P(X_k|\underline{R}_i) - P_j(X_k)\sum_i N_{ij} P(X_k|\underline{R}_i)]$$

$$= -\sum_k R_{kj} - P_j(X_k)N_{jk} \qquad j=1,2,... \qquad (6)$$

where

$$R_{kj} = \sum_i P(X_k|\underline{R}_i) = \sum_i R_{ij}\, h^{-1}(\underline{R}_i)p(\underline{R}_i|X_k)A(X_k) \qquad (7a)$$

$$N_{kj} = \sum_i N_{ij}\, P(X_k|\underline{R}_i) = \sum_i N_{ij}\, h^{-1}(\underline{R}_i)p(\underline{R}_i|X_k)A(X_k). \qquad (7b)$$

The likelihood equations for the c_j's are obtained by setting the right hand sides of expressions like (6) to zero:

$$0 = \sum_k [R_{kj} - P_j(X_k)\, N_{kj}] \qquad j=1,2,... \qquad (8a)$$

Similar computations yield the likelihood equations for slopes:

$$0 = \sum_k [R_{kj} - P_j(X_k)\, N_{kj}]\, X_k \qquad j=1,2,... \qquad (8b)$$

Solution of (8a) and (8b) proceeds in cycles that closely resemble the EM algorithm (Dempster et al., 1977). In the E-step of each cycle, R_{kj} and N_{kj} are evaluated via (7a) and (7b) with respect to provisional estimates of item parameters. In the M-step, (8a) and (8b) are solved for the item parameters, with the N_{kj} and R_{kj} values from the E-step treated as known. Cycles continue until corrections to the item parameters are negligible (less than .01 in the current application).

An approximation of the covariance matrix of estimation errors of the item parameters is obtained by taking the negative inverse of the matrix of M-step second derivatives; that is, the derivatives of the right hand sides of (8a) and (8b), with the N_{kj} and R_{kj} treated as known. Standard errors are available as the square roots of the diagonal elements of the result. As the number of responses per school increases, these values approach the correct MML standard errors from below.

Approximate tests of item and test fit are obtained in a manner similar to that used in the 1979-80 grade 3 calibrations (Bock and Mislevy,

1981). The score scale is divided into ten fractiles in the following manner: the lowest and highest fractile boundaries are selected so as to ensure that the estimated scale scores of about 5 percent of the calibration sample schools fall in both the lowest and highest fractiles, and the interval between these lowest and highest boundaries is divided into eight sub-intervals of equal length. A scale score θ_m is estimated for each fractile by maximizing an expression like (2) with respect to the item parameter estimates and the vectors of attempts N_{mj} and correct responses R_{mj} observed in total from all schools with scale score estimates falling within fractile m. A chi-square test for the fit of item j is then given by

$$X^2 = \sum_m (R_{mj} - N_{mj})^2/[N_{mj}P_{mj}(1-P_{mj})],$$

where P_{mj} is the probability of a correct response given the item parameters and θ_m. The degrees of freedom for this index is the number of fractiles minus two. A chi-square for the fit of the model to the entire element as a whole is obtained by summing the item fit chi-squares for all the items in an element, with degrees of freedom similarly summed.

Two modifications to the procedures described above were also incorporated in the present application. First, each element was also fit with the so-called "one-parameter" model in which the slopes for all the items in an element are constrained to be equal. Estimation proceeded as described above, with the exception that the likelihood equation for the common slope parameter is the sum of expressions like (8b) over items. Second, Bayes modal rather than straight maximum likelihood estimation was carried out in order to enhance the stability of estimates of item slopes in the unconstrained model. A common log-normal prior was assumed for all slopes in a given element, with mean μ_a and standard deviation σ_a. The effect of this modification

on the estimation equations is to augment the likelihood equation for slopes [8b] with the "penalty function" given by

$$-[\log(a_j)-\mu_a]/a_j\sigma_a^2$$

and the second derivative by the term

$$[1-\log(a_j)+\mu_a]/a_j^2\sigma_a^2.$$

In the current application, μ_a was set to the value of the common slope estimated in the one-parameter model, and σ_a was set to one. These values imply a prior belief that at least 95 percent of the slope have values that lie between 10 percent and 700 percent of the value of the common slope estimate. This prior is obviously very mild, functioning mainly to keep slope estimates from becoming either negative or infinite.

Appendix A presents portions of the printout from a pilot calibration of the skill element "Classification of Whole Numbers" in mathematics, as produced by the BILOG computer program (Mislevy and Bock, 1982). Both the one- and two-parameter solutions are shown. Also shown are the numbers of attempts and correct responses to each item from the calibration sample and item-test correlations computed with the data grouped by schools.

Calibration Results

Tables 1, 2, and 3 present test fit statistics for the elements of reading, mathematics, and written language, respectively, from both the one- and two-parameter measurement models; that is, a model in which all item dispersions are constrained to be equal and a model in which they are not. It should be pointed out that the fit chi-squares of the one- and two-parameter solutions for a given element are not, rigorously speaking, strictly comparable in the sense that their difference follows a chi-square distribution. Their relative sizes do, however, suggest the comparative fit of the

TABLE 1
FIT STATISTICS FOR READING ELEMENTS

ELEMENT NAME	1-PARAMETER MODEL CHI	DF	PROB	2-PARAMETER MODEL CHI	DF	PROB
PREFIXES, ROOTS, AND SUFFIXES	204.3	144.0	0.0007	129.4	128.0	0.4497
GENERAL VOCABULARY	142.9	117.0	0.0523	115.9	104.0	0.2005
SCIENCE VOCABULARY	127.4	99.0	0.0289	88.3	88.0	0.4711
SOCIAL STUDIES VOCABULARY	142.0	117.0	0.0576	111.1	104.0	0.2983
USING CONTEXT WITH MULTIPLE-MEANING WORDS	194.8	153.0	0.0126	152.9	136.0	0.0576
DETAILS FROM A SINGLE SENTENCE	130.5	126.0	0.3727	117.8	112.0	0.3343
DETAILS FROM TWO OR MORE SENTENCES	179.9	153.0	0.0676	133.8	136.0	0.5378
PRONOUN REFERENCES	192.3	144.0	0.0044	154.3	128.0	0.0565
SEQUENCE	130.4	135.0	0.5965	133.3	120.0	0.1915
MAIN IDEAS	145.8	144.0	0.4433	123.0	128.0	0.6095
CAUSE AND EFFECT	184.9	135.0	0.0028	134.0	120.0	0.1801
FOLLOWING ORGANIZATION	147.6	144.0	0.4020	134.9	128.0	0.3217
PUTTING INFORMATION TOGETHER	175.4	135.0	0.0110	128.5	120.0	0.2815
PREDICTING OUTCOMES	175.0	162.0	0.2297	148.3	144.0	0.3860
MAKING COMPARISONS AND CONTRASTS	200.6	153.0	0.0059	140.7	136.0	0.3734
DRAWING CONCLUSIONS FROM DETAILS	202.6	144.0	0.0009	147.1	128.0	0.1194
DRAWING CONCLUSIONS FROM OVERALL MEANING	108.7	126.0	0.8649	108.3	112.0	0.5806
ANALYZING CHARACTER	157.1	162.0	0.5945	128.8	144.0	0.8126
IDENTIFYING SETTING	104.6	108.0	0.5750	101.4	96.0	0.3340
SUMMARIZING PLOT	122.2	117.0	0.3535	98.7	104.0	0.6294
UNDERSTANDING DIALOGUE	117.0	108.0	0.2604	103.6	96.0	0.2798
SENSING MOOD	120.4	108.0	0.1961	85.8	96.0	0.7637
UNDERSTANDING FIGURATIVE LANGUAGE	156.6	108.0	0.0016	115.8	96.0	0.0830
DETECTING AUTHOR AND AUTHOR'S ATTITUDE	128.5	108.0	0.0872	112.1	96.0	0.1250
DETECTING AUTHOR'S PURPOSE	195.4	171.0	0.0969	148.9	152.0	0.5549
SEPARATING FACT FROM OPINION	133.7	144.0	0.7203	92.4	128.0	0.9924
APPLICATIONS TO A DIFFERENT CONTEXT	134.9	135.0	0.4866	120.4	120.0	0.4726
REFERENCE MATERIALS AND PARTS OF A BOOK	150.9	135.0	0.1658	151.8	120.0	0.0263
MAPS, GRAPHS, AND CHARTS	133.9	135.0	0.5100	106.4	120.0	0.8086
COMPREHENSION OF LITERATURE PASSAGES: LITERAL	182.2	153.0	0.0537	116.5	136.0	0.8860
COMPREHENSION OF LITERATURE PASSAGES: INFERENTIAL	384.5	261.0	0.0	248.8	232.0	0.2140
COMPREHENSION OF LITERATURE PASSAGES: INTERPRETIVE	806.8	549.0	0.0	442.3	488.0	0.9317
COMPREHENSION OF LITERATURE PASSAGES: CRITICAL/APPLICATIVE	128.9	90.0	0.0046	64.9	80.0	0.8897
COMPREHENSION OF SCIENCE PASSAGES: LITERAL	191.2	153.0	0.0197	147.2	136.0	0.2416
COMPREHENSION OF SCIENCE PASSAGES: INFERENTIAL	742.6	522.0	0.0	469.3	464.0	0.4227
COMPREHENSION OF SCIENCE PASSAGES: CRITICAL/APPLICATIVE	330.8	252.0	0.0006	208.6	224.0	0.7616
COMPREHENSION OF SOCIAL SCIENCE PASSAGES: LITERAL	363.0	252.0	0.0	259.6	224.0	0.0513
COMPREHENSION OF SOCIAL SCIENCE PASSAGES: INFERENTIAL	429.5	360.0	0.0069	343.3	320.0	0.1774
COMPREHENSION OF SOCIAL SCIENCE PASSAGES: INTERPRETIVE	143.3	135.0	0.2962	99.9	120.0	0.9093
COMPREHENSION OF SOCIAL SCIENCE PASSAGES: CRITICAL/APPLICATIVE	252.2	216.0	0.0460	184.0	192.0	0.6471

TABLE 2
FIT STATISTICS FOR MATHEMATICS ELEMENTS

ELEMENT NAME	1-PARAMETER MODEL CHI	DF	PROB	2-PARAMETER MODEL CHI	DF	PROB
COUNTING AND NUMERATION	182.9	135.0	0.0038	164.6	120.0	0.0044
PLACE VALUE	89.2	90.0	0.5055	116.4	80.0	0.0050
COUNTING & PLACE VALUE APPLICATIONS	156.4	135.0	0.1004	131.6	120.0	0.2213
ORDERING & PROPERTIES	143.3	135.0	0.2963	96.0	120.0	0.9480
CLASSIFICATION OF NUMBERS	265.4	180.0	0.0	150.9	160.0	0.6842
NATURE OF NUMBERS AND PROPERTIES APPLICATIONS	164.6	135.0	0.0422	98.7	120.0	0.9228
ADDING AND SUBTRACTING WHOLE NUMBERS	134.2	135.0	0.5043	133.9	120.0	0.1824
MULTIPLYING WHOLE NUMBERS	135.4	126.0	0.2674	138.2	112.0	0.0469
DIVIDING WHOLE NUMBERS	149.1	135.0	0.1923	111.8	120.0	0.6913
ADDING AND SUBTRACTING DECIMALS	150.9	126.0	0.0648	115.1	112.0	0.4013
MULTIPLYING AND DIVIDING DECIMALS	174.3	108.0	0.0001	93.8	96.0	0.5448
OPERATIONS ON FRACTIONS	202.3	144.0	0.0010	135.9	128.0	0.2988
PERCENTS AND EQUIVALENT FRACTIONS/DECIMALS	118.7	108.0	0.2260	113.9	96.0	0.1030
APPLICATIONS: ONE-STEP WITH WHOLE NUMBERS	137.2	108.0	0.0302	103.8	96.0	0.2746
APPLICATIONS: ONE-STEP WITH RATIONAL NUMBERS	196.6	180.0	0.1886	164.3	160.0	0.3907
APPLICATIONS: TWO OR MORE ST	131.0	135.0	0.5823	117.2	120.0	0.5550
EXPRESSIONS AND EQUATIONS	150.3	135.0	0.1739	104.3	120.0	0.8449
GRAPHS AND FUNCTION TABLES	102.5	108.0	0.6325	95.1	96.0	0.5076
EXPRESSIONS, EQUATIONS AND GRAPHING APPLICATIONS	139.8	135.0	0.3700	102.3	120.0	0.8777
SHAPES AND TERMINOLOGY	96.8	108.0	0.7713	90.1	96.0	0.6498
GEOMETRIC RELATIONSHIPS	130.5	108.0	0.0696	73.5	96.0	0.9572
GEOMETRY APPLICATIONS	169.2	144.0	0.0742	154.2	128.0	0.0574
METRIC UNITS	255.3	180.0	0.0002	139.4	160.0	0.8783
U.S. CUSTOMARY UNITS	97.9	90.0	0.2665	100.5	80.0	0.0600
LENGTH, AREA, AND VOLUME	185.6	108.0	0.0	78.8	96.0	0.8996
MEASUREMENT APPLICATIONS	161.7	144.0	0.1490	133.3	128.0	0.3441
PROBABILITY	111.4	108.0	0.3917	103.1	96.0	0.2921
STATISTICS	141.2	99.0	0.0035	106.7	88.0	0.0851
TABLES AND GRAPHS	150.0	135.0	0.1778	135.1	120.0	0.1634
INTEGRATED APPLICATIONS	155.0	135.0	0.1147	148.2	120.0	0.0412
FORMULATIONS	159.7	135.0	0.0798	112.8	120.0	0.6666
ANALYSIS AND STRATEGY	274.3	225.0	0.0137	185.6	200.0	0.7603
INTERPRETATION	125.1	108.0	0.1252	112.2	96.0	0.1242

TABLE 3
FIT STATISTICS FOR WRITTEN LANGUAGE ELEMENTS

ELEMENT NAME	1-PARAMETER MODEL CHI	DF	PROB	2-PARAMETER MODEL CHI	DF	PROB
JUDGING WRITING	215.7	198.0	0.1849	182.7	176.0	0.3491
TOPIC SENTENCES	99.4	90.0	0.2335	122.8	80.0	0.0015
DETAILS SEQUENCE	116.7	90.0	0.0306	112.9	80.0	0.0090
OUTLINE ORGANIZATION	77.6	90.0	0.8222	67.1	80.0	0.8487
VERB PRONOUN USE	77.1	60.0	0.0672	90.0	80.0	0.2073
SIMPLE SENTENCES	160.4	117.0	0.0048	103.6	104.0	0.4917
COMPOUND SENTENCES	99.2	117.0	0.8822	112.7	104.0	0.2624
COMPLEX SENTENCES	144.5	126.0	0.1237	125.8	112.0	0.1767
CONJUNCTIONS	98.7	90.0	0.2483	111.6	80.0	0.0114
SUPPLYING SUBJECTS	115.8	104.0	0.2025	95.2	91.0	0.3607
SUPPLYING PREDICATES	114.4	117.0	0.5497	100.5	104.0	0.5777
FORMING SENTENCES	148.8	126.0	0.0805	122.9	112.0	0.2265
SENSORY WORDS	97.0	90.0	0.2887	91.6	80.0	0.1770
SPECIFIC WORDS	84.3	90.0	0.6509	60.3	80.0	0.9508
ACHIEVING TONE	103.8	90.0	0.1514	84.3	80.0	0.3482
IRREGULAR VERBS	83.5	90.0	0.6724	69.2	80.0	0.7995
PRONOUNS	93.0	90.0	0.3939	234.9	80.0	0.0
SUBJECT-VERB AGREEMENT	166.3	90.0	0.0	139.8	80.0	0.0
NOUN DETERMINERS	75.3	70.0	0.3108	80.5	70.0	0.1840
DOUBLE NEGATIVES	90.8	90.0	0.4567	96.2	80.0	0.1047
SUFFIXES	144.6	90.0	0.0002	119.4	80.0	0.0029
IRREGULAR NOUN PLURALS	120.0	90.0	0.0190	84.2	80.0	0.3514
CONTRACTIONS	102.7	108.0	0.6258	88.3	96.0	0.6991
SPELLING PREDICTABLE WORDS	123.2	135.0	0.7577	132.8	120.0	0.1996
SPELLING WORDS WITH SUFFIXES	194.3	135.0	0.0006	116.1	120.0	0.5836
SPELLING DEMONS	91.3	90.0	0.4413	67.7	80.0	0.8354
SPELLING HOMOPHONES	107.6	90.0	0.0998	84.1	80.0	0.3565
CAPITALIZATION	139.6	126.0	0.1917	132.1	112.0	0.0945
PUNCTUATION	150.9	126.0	0.0646	109.4	112.0	0.5511

two models. In general the fit is very good. Only one element of more than a hundred has a fit chi-square that exceeds twice its degrees of freedom in the two-parameter solutions. Closer examinations of the item statistics in this element (pronouns, in written language) reveals two items with erratic but not systematic departures from the model.

It will be noted that even the one-parameter model shows reasonably good fit considering the large size of the calibration sample. Improvement in fit of the two-parameter model over the one-parameter model seems significant but not dramatic in many elements, with a notable exception being those reading comprehension elements defined with respect to passage topics (i.e., literature, science, or social science). In these eleven elements defined at a higher level of generality of skills than the other elements, the two-parameter model lead to comparatively greater improvements in fit. Variation in item dispersion estimates within these elements appears to be related to both item content, as indicated by the membership of the items in the more narrowly defined elements, and assessment form appearance, as shown by some tendency for items from a given form to have higher or lower than average dispersions. Variation of the first type suggests departures from the IRT assumption of unidimensionality, caused by scaling a collection of items more heterogeneous in the skills they demand; variation of the second type reflects departure from the assumption of local independence, caused by the administration of more than one item from an element to a student. The resultant good fit statistics, however, indicate that the model is well able to explain school attainment despite these departures from the idealized assumptions.

Appendix B presents item parameter estimates in the two-parameter model for all 102 skill elements. These are the values that are to be used in content-referenced interpretations of grade 6 CAP scale scores. It will be

noted that these item parameters have been transformed from the provisional standard normal calibration scaling. The final scaling of the 1981-82 Grade 6 item parameters and scale scores was determined in a manner that made the statewide weighted standard deviation of school scores in each element 50 and the weighted statewide mean of 1979-80 equal to 250. The current assessment was not administered in 1979-80, so the choice of origin required back-equating of 1979-80 results on the old assessment instrument to scores on the new scale; this was accomplished by the procedures outlined in the section of this report dealing with the equating of the old and new assessments.

The relationship between the percent-correct and scale score metrics can be understood through an application of the basic CAP measurement model, Equation (1). Given the parameters of item j and a value of θ, (1) gives the expected probability of a correct response. If this process is applied to all items in an element and the expected item scores are summed and then divided by the number of items in the element, then an expected percent correct score for the given value of θ is obtained. Similarly, the expected percent-correct score in a higher-level skill area for a given vector of scale scores in the constituent elements is readily obtained as the average expected item score. Tables 4, 5, and 6 present such results for the elements and higher-level skill areas in the three major content areas for values of θ ranging from 100 to 500. The expected percents correct in higher-level skill areas assume flat score profiles across the elements that comprise the skill area.

SCORING PROCEDURES

CAP scale scores are defined at the level of an individual school's performance in a single skill element. The first subsection of this section describes the estimation of these basic scores. The next subsection concerns aggregations of results across (a) the skill dimension, or to skill areas

TABLE 4

EXPECTED PERCENTS-CORRECT FOR GIVEN SCALE SCORES: GRADE 6 WRITTEN LANGUAGE

REPORTING CATEGORY	SCALE SCORE / 10.0																														
	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
WRITING PROCESS SKILLS	32	34	37	40	43	46	49	52	55	58	60	63	66	68	71	73	75	77	79	80	82	83	85	86	87	88	89	90	91	92	92
JUDGING STUDENT WRITING	37	39	41	44	46	48	51	53	56	58	61	63	65	67	69	71	73	75	77	79	80	81	83	84	85	86	87	88	89	90	91
PARAGRAPHS	32	35	38	41	44	47	51	54	58	61	64	67	70	73	75	77	79	81	83	84	86	87	88	89	90	91	92	92	93	93	94
TOPIC SENTENCES	32	34	37	40	43	46	49	53	56	59	62	65	68	71	73	75	77	79	81	82	84	85	86	87	88	89	90	90	91	92	92
DETAILS AND SEQUENCE	33	35	38	42	45	48	52	55	59	62	65	68	71	74	76	78	80	82	84	85	86	88	89	90	91	91	92	93	94	94	95
OUTLINES FOR ORGANIZATION	28	31	34	36	39	42	45	48	52	55	58	61	64	66	69	72	74	76	79	80	82	84	86	87	88	89	90	91	92	93	94
VERB TENSE & PRONOUN USAGE	37	40	43	46	50	53	57	61	64	68	71	74	77	79	81	83	85	87	88	89	90	91	92	92	93	93	94	94	95	95	96
SENTENCE COMBINING	29	31	33	35	38	40	43	46	48	51	54	56	59	61	64	66	69	71	73	75	77	79	80	82	83	85	86	87	88	89	90
SIMPLE SENTENCES W/ MODIFICATION	22	24	25	26	28	30	32	33	35	37	39	41	44	46	48	50	53	55	57	60	62	64	66	68	70	72	73	75	77	78	79
COMPOUND SENTENCES	27	29	31	34	36	39	41	44	46	49	52	55	57	60	63	65	68	70	73	75	77	79	81	82	84	86	87	88	89	90	91
COMPLEX SENTENCES	27	29	32	34	37	40	43	45	48	52	55	58	60	63	66	69	71	74	76	78	80	82	84	85	87	88	89	90	91	92	93
CONJUNCTIONS	41	44	48	51	54	57	61	64	67	70	73	76	78	81	83	85	87	89	90	91	93	94	94	95	96	96	97	97	97	98	98
SENTENCE RECOGNITION	32	35	39	42	45	49	52	55	58	61	64	67	69	72	74	76	77	79	80	82	83	84	86	87	88	88	89	90	91	91	92
SUPPLYING SUBJECTS	37	41	46	51	56	61	65	70	74	78	81	84	87	89	91	92	93	95	95	96	97	97	98	98	98	99	99	99	99	99	99
SUPPLYING PREDICATES	38	42	45	49	53	56	60	64	67	70	73	76	79	81	84	86	87	89	91	92	93	94	95	95	96	97	97	97	98	98	98
FORMING COMPLETE SENTENCES	23	24	26	27	29	31	32	34	36	38	40	42	44	46	48	51	53	55	57	59	61	64	66	68	69	71	73	75	76	78	79
LANGUAGE CHOICES	31	34	37	39	42	46	49	52	55	58	61	65	68	70	73	76	78	80	82	84	85	87	88	89	90	91	92	93	94	94	95
SENSORY WORDS	37	40	42	45	47	50	53	56	58	61	64	67	69	72	74	77	79	80	82	84	85	86	87	88	89	90	91	92	92	93	93
SPECIFIC WORDS & SENTENCES	24	26	28	31	34	36	39	42	45	48	52	55	58	61	64	67	70	72	75	77	79	81	83	85	87	88	89	90	91	92	93
ACHIEVING TONE	33	36	39	43	46	50	54	58	62	65	69	72	75	78	81	83	85	87	89	90	92	93	94	95	95	96	97	97	97	98	98
SUPPORT SKILLS	34	37	39	42	45	48	51	54	57	60	63	65	68	70	72	74	76	78	80	81	83	84	85	87	88	89	89	90	91	92	92
STANDARD ENGLISH USAGE	34	37	40	43	47	50	54	57	60	64	67	70	72	75	77	79	81	82	84	85	87	88	89	90	91	91	92	93	93	94	94
IRREGULAR VERBS	30	33	36	39	42	46	49	53	56	60	63	67	70	73	76	78	81	83	85	87	88	90	91	92	93	94	95	95	96	96	97
PRONOUNS	45	46	48	49	50	51	53	54	56	57	59	60	62	63	64	65	67	68	70	71	73	74	75	77	78	79	81	82	83	84	85
SUBJECT-VERB AGREEMENT	29	31	34	37	40	44	47	50	54	57	60	63	66	68	71	73	75	77	79	81	82	84	85	86	87	88	89	89	90	91	91
NOUN DETERMINERS	38	42	47	51	56	61	66	70	75	79	82	85	88	90	92	93	95	96	96	97	98	98	98	99	99	99	99	99	100	100	100
DOUBLE NEGATIVES	29	33	36	40	44	49	53	57	62	66	70	73	76	79	82	85	87	89	90	92	93	94	95	96	96	97	97	98	98	98	99
WORD FORMS	31	34	36	39	43	46	49	52	56	59	62	65	68	70	73	75	77	79	81	83	84	85	87	88	89	90	91	91	92	93	93
SUFFIXES	33	36	39	43	47	51	55	58	62	66	69	72	75	77	79	81	83	84	85	86	87	88	89	90	90	91	91	92	92	92	92
IRREGULAR NOUN PLURALS	24	26	29	32	35	38	41	45	48	52	55	59	62	65	68	71	74	77	79	81	83	85	87	88	90	91	92	93	94	95	95
CONTRACTIONS	35	38	41	43	46	49	51	54	57	59	62	64	67	69	71	73	75	77	79	81	82	83	85	86	87	88	89	90	91	92	92
SPELLING	35	37	40	42	45	47	50	52	55	57	60	62	65	67	69	71	73	75	77	79	80	82	83	84	85	87	88	88	89	90	91
PREDICTABLE WORDS	38	40	43	45	47	50	52	55	57	59	62	64	66	69	71	73	75	77	79	81	82	84	85	86	88	89	90	91	92	92	93
WORDS WITH SUFFIXES	30	32	34	36	38	41	43	45	48	50	53	55	57	60	62	64	66	68	70	72	73	75	76	78	79	80	81	82	83	84	85
DEMONS	36	39	42	45	48	51	54	57	60	63	65	68	70	73	75	77	79	81	83	84	86	87	88	89	90	91	92	93	94	94	95
HOMOPHONES	39	41	43	45	48	50	52	55	57	60	62	64	67	69	71	73	75	77	79	80	82	83	85	86	87	88	89	90	90	91	92
CAPITALIZATION AND PUNCTUATION	37	39	41	43	46	48	51	53	56	58	60	63	65	67	69	71	73	75	77	78	80	81	82	84	85	86	87	88	89	89	90
CAPITALIZATION	43	44	46	48	49	51	53	55	57	59	61	63	65	67	69	70	72	74	75	77	78	79	81	82	83	84	85	86	87	88	89
PUNCUATION	31	33	36	39	42	45	48	51	54	57	60	63	65	68	70	73	75	77	79	80	82	83	84	86	87	88	89	89	90	91	92
TOTAL WRITTEN LANGUAGE	33	35	38	41	44	47	50	53	56	59	61	64	67	69	71	74	76	78	79	81	82	84	85	86	87	88	89	90	91	92	92

TABLE 5

EXPECTED PERCENTS-CORRECT FOR GIVEN SCALE SCORES: GRADE 6 MATHEMATICS

REPORTING CATEGORY	SCALE SCORE / 10.0																															
	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
COUNTING, NUMERATION, & PLACE VALUE	25	27	29	31	33	36	38	41	44	47	49	52	55	58	61	64	66	69	72	74	76	78	80	82	84	85	87	88	89	91	92
CNPV SKILLS	28	30	32	34	36	38	41	43	46	49	51	54	57	60	63	65	68	71	73	75	78	80	82	83	85	87	88	89	91	92	93
COUNTING AND NUMERATION	31	33	35	37	39	41	43	46	48	51	53	56	59	61	64	67	69	72	74	76	78	80	82	84	85	87	88	89	91	92	93
PLACE VALUE	22	24	27	29	31	34	37	40	42	45	48	51	54	57	60	63	66	69	72	74	77	79	81	83	85	86	88	89	90	91	92
CNPV APPLICATIONS	21	23	25	27	29	32	34	37	40	43	46	49	52	55	58	61	64	67	69	72	74	76	78	80	82	84	85	86	88	89	90
NATURE OF NUMBERS & PROPERTIES	28	30	31	33	35	38	40	42	44	47	49	51	54	56	58	61	63	65	67	69	71	73	75	76	78	79	81	82	83	85	86
NNP SKILLS	28	30	32	34	36	38	40	42	44	47	49	51	54	56	58	60	63	65	67	69	71	72	74	76	77	79	80	82	83	84	85
ORDERING AND PROPERTIES	32	34	36	38	41	43	45	47	50	52	55	57	59	62	64	66	68	71	73	75	76	78	80	81	83	84	86	87	88	89	90
CLASSIFATION OF NUMBERS	25	26	28	30	32	34	36	38	40	43	45	47	49	52	54	56	58	60	62	64	66	68	70	72	73	75	76	78	79	80	81
NNP APPLICATIONS	28	29	31	33	35	37	39	42	44	46	49	51	54	56	59	61	63	66	68	70	72	74	76	78	79	81	82	84	85	86	87
OPERATIONS	26	28	30	32	34	36	39	41	44	46	49	51	54	56	59	61	64	66	68	71	73	75	77	78	80	82	83	84	86	87	88
SKILLS	28	30	32	35	37	39	42	44	47	50	52	55	57	60	62	65	67	70	72	74	76	78	80	82	83	85	86	87	88	89	90
ADD/SUBTRACT WHOLE NUMBERS	43	45	48	51	53	56	59	61	64	66	69	71	73	75	77	79	81	83	84	85	87	88	89	90	91	92	92	93	94	94	95
MULTIPLY WHOLE NUMBERS	39	42	45	48	51	54	57	60	63	65	68	71	73	75	77	79	81	83	84	85	87	88	89	90	91	92	92	93	94	94	95
DIVIDE WHOLE NUMBERS	31	34	36	39	42	44	47	50	53	56	59	62	65	67	70	72	74	76	78	80	82	83	85	86	87	88	89	90	91	92	92
ADD/SUBTRACT DECIMAL NUMBERS	23	25	27	28	30	32	34	37	39	41	44	46	49	51	54	57	60	62	65	67	70	72	74	77	78	80	82	84	85	86	88
MULTIPLY/DIVIDE DECIMAL NUMBERS	20	21	23	25	26	28	30	32	34	36	39	41	44	46	49	52	54	57	60	62	65	68	70	73	75	77	79	81	83	84	86
OPERATIONS ON FRACTIONS	16	18	19	21	23	[illegible]	27	29	31	34	37	39	42	45	48	51	54	58	61	64	66	69	72	74	77	79	81	83	84	86	87
PERCENTS AND EQUIVALENT FRACTIONS	24	26	28	30	33	35	38	41	43	46	49	52	54	57	60	63	65	68	70	72	75	77	79	80	82	84	85	87	88	89	90
APPLICATIONS	21	23	25	26	28	30	33	35	37	39	42	44	47	49	52	54	56	59	61	63	66	68	70	72	73	75	77	78	80	81	83
ONE STEP, W/WHOLE NUMBERS	28	31	33	35	38	41	43	46	49	52	55	58	60	63	66	68	70	73	75	77	78	80	82	83	84	85	86	87	88	89	90
ONE STEP, W/RATIONAL NUMBERS	20	22	23	25	27	29	31	33	35	37	39	42	44	46	49	51	54	56	58	61	63	65	67	70	71	73	75	77	78	80	81
TWO OR MORE STEPS	17	18	20	21	23	25	26	28	30	32	35	37	39	42	44	46	49	51	54	56	59	61	63	65	68	70	71	73	75	77	78
EXPRESSIONS, EQUATIONS, GRAPHS	26	28	30	[illegible]	[illegible]	37	39	41	44	47	49	52	54	57	59	62	64	67	69	71	73	75	77	79	80	82	83	84	86	87	88
SKILLS	24	26	28	30	32	35	37	40	42	45	47	50	53	55	58	60	63	65	68	70	72	74	76	78	80	81	83	84	86	87	88
EXPRESSIONS AND EQUATIONS	26	28	30	33	35	37	40	43	45	48	51	53	56	58	61	64	66	68	70	73	75	77	78	80	82	83	84	86	87	88	89
GRAPHS AND FUNCTION TABLES	22	24	25	27	29	31	34	36	38	41	43	46	49	51	54	56	59	62	64	67	69	71	74	76	78	79	81	83	84	86	87
APPLICATIONS	29	31	33	35	37	40	42	45	47	50	52	55	57	60	62	65	67	69	71	73	75	76	78	79	81	82	83	85	86	87	88
GEOMETRY	28	30	32	34	37	39	41	43	46	48	51	53	56	58	60	63	65	67	70	72	74	76	77	79	81	82	84	85	86	87	88
SKILLS	27	29	31	33	35	38	40	42	45	47	50	52	55	57	60	62	65	67	70	72	74	76	78	80	81	83	84	86	87	88	89
SHAPES AND TERMINOLOGY	26	28	30	33	35	38	40	43	46	49	51	54	57	60	62	65	68	70	72	75	77	78	80	82	84	85	86	88	89	90	91
RELATIONSHIPS	28	30	32	33	35	37	39	42	44	46	48	50	53	55	57	60	62	64	67	69	71	73	75	77	79	81	82	84	85	87	88
APPLICATIONS	31	32	34	36	38	41	43	45	47	50	52	54	57	59	61	63	66	68	70	72	73	75	77	78	80	81	83	84	25	86	87
MEASUREMENT	25	26	28	30	32	35	37	39	42	44	47	49	52	54	57	59	62	64	66	68	71	73	75	76	78	80	81	83	84	85	86
SKILLS	26	28	30	32	34	36	38	41	43	46	48	51	53	56	58	60	63	65	67	69	71	73	75	77	78	80	81	83	84	85	86
METRIC UNITS	24	26	27	29	32	34	36	38	41	43	46	48	50	53	55	58	60	62	65	67	69	71	73	74	76	77	79	80	81	83	84
US UNITS	30	33	36	39	42	45	48	52	55	58	62	65	68	70	73	75	77	79	81	83	84	86	87	88	89	90	91	92	93	94	94
LENGTH, AREA, AND VOLUME	26	27	28	30	31	32	34	36	37	39	41	43	45	48	50	52	55	57	60	62	65	67	69	72	74	76	78	79	81	82	84
APPLICATIONS	21	23	25	26	28	31	33	35	37	40	42	45	48	50	53	56	58	61	64	66	69	71	73	75	77	79	81	83	84	86	87

(CONTINUED)

TABLE 5, CONTINUED

EXPECTED PERCENTS-CORRECT FOR GIVEN SCALE SCORES: GRADE 6 MATHEMATICS

REPORTING CATEGORY	SCALE SCORE / 10.0																													
	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
PROBABILITY AND STATISTICS	23	24	26	28	30	32	34	36	39	41	44	47	49	52	55	58	60	63	65	68	70	72	74	76	78	80	81	83	84	86	87
PROBABILITY	17	19	20	22	24	26	28	30	33	35	38	40	43	46	49	52	54	57	60	63	65	68	70	72	74	76	78	80	81	83	84
STATISTICS	28	30	32	34	36	38	41	43	46	48	51	53	56	59	61	64	66	69	71	73	76	78	79	81	83	84	85	86	87	88	89
TABLES, GRAPHS, APPLICATIONS	29	31	33	36	38	40	43	45	48	51	53	56	59	61	64	66	69	71	73	76	78	79	81	83	84	86	87	88	89	90	91
TABLES AND GRAPHS	31	33	35	37	40	42	45	47	50	53	55	58	61	63	66	68	71	73	75	77	79	81	82	84	85	87	88	89	90	91	92
INTEGRATED APPLICATIONS	28	30	32	34	36	38	41	43	46	49	51	54	57	59	62	65	67	69	72	74	76	78	80	81	83	84	86	87	88	89	90
PROBLEM SOLVING	25	27	29	31	33	35	37	40	42	45	47	50	52	55	57	60	62	65	67	69	71	73	75	77	78	80	81	83	84	85	86
FORMULATION	27	30	32	35	38	40	43	46	49	52	55	58	61	64	66	69	71	74	76	78	80	82	83	85	86	87	88	89	90	91	92
ANALYSIS AND STRATEGY	29	31	33	36	38	40	43	45	48	51	53	55	58	60	62	64	66	68	70	72	74	75	77	78	79	81	82	83	84	85	86
INTERPRETATION	19	20	22	23	25	27	28	30	32	34	37	39	41	43	46	48	50	52	55	57	59	61	63	65	67	69	71	73	74	76	77
SOLUTION OF PROBLEMS	24	26	28	30	32	34	37	39	41	44	46	49	51	54	57	59	61	64	66	68	71	73	75	76	78	80	81	83	84	85	86
TOTAL MATHEMATICS	26	28	30	32	34	37	39	41	44	46	49	52	54	57	59	62	64	66	69	71	73	75	77	78	80	82	83	84	86	87	88

TABLE 6

EXPECTED PERCENTS-CORRECT FOR GIVEN SCALE SCORES: GRADE 6 READING

REPORTING CATEGORY	SCALE SCORE / 10.0																														
	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
VOCABULARY	28	31	33	36	39	42	45	48	51	55	58	60	63	66	68	71	73	75	77	79	81	82	83	85	86	87	88	89	90	90	91
PREFIXES, ROOTS, SUFFIXES	28	30	33	35	38	40	43	46	49	52	55	57	60	63	65	67	70	72	74	75	77	78	80	81	82	83	84	85	86	86	87
WORD MEANINGS	26	28	31	34	36	39	42	45	49	52	55	58	61	63	66	68	71	73	75	77	79	80	82	83	85	86	87	88	89	90	90
USING CONTEXT W/ MULTIPLE-MNG WORDS	33	36	40	43	47	50	54	57	60	63	66	69	72	75	77	79	81	83	85	86	88	89	90	91	92	93	94	95	95	96	96
COMPREHENSION	30	32	35	38	41	44	47	50	53	56	59	62	64	67	70	72	74	76	78	80	82	83	85	86	87	88	89	90	91	92	92
LITERAL	34	37	40	43	46	50	53	56	59	62	65	68	71	73	76	78	80	82	83	85	87	88	89	90	91	92	93	93	94	95	95
DETAILS	36	39	43	46	49	53	56	59	63	66	69	72	74	77	79	81	83	85	87	88	90	91	92	93	93	94	95	95	96	96	97
FROM A SINGLE SENTENCE	35	38	41	45	48	52	55	59	62	65	69	72	74	77	79	81	83	85	87	88	90	91	92	93	94	94	95	96	96	97	97
FROM TWO OR MORE SENTENCES	38	41	44	47	50	53	56	60	63	66	69	72	74	77	79	81	83	85	87	88	89	91	92	93	93	94	95	95	96	96	97
PRONOUN REFERENCES	34	37	39	42	45	48	51	54	57	60	63	66	68	71	73	75	77	79	81	83	84	85	87	88	89	90	91	91	92	93	93
SEQUENCE	31	34	36	39	42	45	48	51	54	57	60	63	66	68	71	73	75	77	79	81	83	84	86	87	88	90	91	91	92	93	94
INFERENTIAL	28	31	33	36	38	41	44	46	49	52	55	58	60	63	65	68	70	72	74	76	78	80	81	83	84	85	86	87	88	89	90
MAIN IDEAS	35	37	40	42	45	48	50	53	56	59	62	64	67	69	72	74	76	78	80	82	83	85	86	88	89	90	91	92	92	93	94
CAUSE-EFFECT	34	36	39	42	45	48	51	54	57	60	64	66	69	72	74	77	79	81	83	84	86	87	88	89	90	91	92	93	94	94	95
FOLLOWING ORGANIZATION	22	24	26	28	30	32	35	37	40	42	45	47	50	53	55	58	60	63	65	67	70	72	74	76	78	79	81	82	84	85	86
PUTTING INFORMATION TOGETHER	24	26	28	30	33	35	38	41	44	46	49	52	55	58	60	63	65	68	70	72	74	76	78	80	81	83	84	86	87	88	89
PREDICTING OUTCOMES	30	33	35	38	40	43	46	49	51	54	57	60	62	65	67	70	72	74	76	78	80	81	83	84	85	87	88	89	90	90	91
COMPARISONS AND CONTRASTS	26	28	30	33	35	37	39	42	44	47	49	51	54	56	58	61	63	65	67	69	70	72	74	75	77	78	80	81	82	83	84
DRAWING CONCLUSIONS FROM DETAILS	26	28	31	33	36	39	41	44	47	50	53	56	58	61	63	66	68	70	72	74	76	78	79	80	82	83	84	85	86	87	88
CONCLUSIONS FROM OVERALL MEANING	31	33	36	39	42	46	49	52	56	59	62	65	68	71	74	76	79	81	83	85	86	88	89	90	91	92	93	94	95	95	96
INTERPRETIVE	31	34	37	40	43	46	50	53	56	60	63	66	69	71	74	76	78	80	82	84	85	87	88	89	90	91	92	93	93	94	94
ANALYZING CHARACTER	32	35	38	41	45	48	51	54	58	61	64	67	69	72	74	77	79	81	83	84	86	87	88	90	91	92	92	93	94	95	95
IDENTIFYING SETTING	36	39	42	45	48	51	55	58	61	64	67	70	73	75	77	80	82	84	85	87	88	89	90	91	92	93	94	95	95	96	96
SUMMARIZING PLOT	30	33	35	38	41	45	48	51	54	58	61	64	67	70	72	74	77	79	81	82	84	85	86	88	89	90	91	91	92	93	93
UNDERSTANDING DIALOGUE	30	33	36	40	43	47	50	54	58	61	65	68	71	74	76	79	81	83	85	86	88	89	90	91	92	93	94	94	95	95	96
SENSING MOOD	26	28	31	33	36	39	42	45	48	51	54	57	59	62	65	68	70	73	75	77	79	81	82	84	85	87	88	89	90	91	91
UNDERSTANDING FIGURATIVE LANGUAGE	31	34	37	41	44	48	52	55	59	63	66	69	72	75	77	79	81	83	85	86	87	89	90	91	91	92	93	93	94	94	95
CRITICAL/APPLICATIVE	26	28	31	34	37	40	43	46	49	52	55	58	61	64	67	70	72	74	76	78	80	82	84	85	86	87	89	90	90	91	92
DETECTING AUTHOR'S ATTITUDE	25	27	30	32	35	38	40	43	47	50	53	56	59	62	64	67	69	72	74	76	78	80	82	83	85	86	87	88	89	90	91
DETECTING AUTHOR'S PURPOSE	28	31	34	37	40	43	47	50	53	56	60	63	66	69	71	74	76	78	80	82	84	85	86	88	89	90	91	92	92	93	93
SEPARATING FACT FROM OPINION	22	24	27	30	33	36	39	42	45	49	52	55	59	62	65	68	70	73	75	78	80	82	83	85	86	88	89	90	91	92	92
APPLICATIONS TO DIFFERENT CONTEXT	28	31	33	36	38	41	44	47	50	52	55	58	61	63	66	68	71	73	75	77	78	80	82	83	84	86	87	88	89	89	90
-LOCATIONAL SKILLS	37	40	43	46	49	52	55	58	61	64	67	70	72	75	77	79	81	83	85	86	88	89	90	91	92	93	94	94	95	95	96
REFERENCE MATERIALS & PARTS OF BOOK	37	40	44	47	51	54	58	61	65	68	71	74	76	79	81	83	85	87	88	89	91	92	93	93	94	95	95	96	96	97	97
MAPS, GRAPHS, AND CHARTS	37	39	42	44	47	50	52	55	58	60	63	66	68	70	73	75	77	79	81	83	84	86	87	89	90	91	92	93	93	94	95

(CONTINUED)

NOTE: Letters are missing from some words used in these tables due to space limitations.

TABLE 6, CONTINUED

EXPECTED PERCENTS-CORRECT FOR GIVEN SCALE SCORES: GRADE 6 READING

REPORTING CATEGORY	SCALE SCORE / 10.0																														
	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
READING IN THE CONTENT AREAS	31	33	36	39	41	44	47	50	53	56	59	62	64	67	69	72	74	76	78	79	81	82	84	85	86	87	88	89	90	91	92
WORD MEANING	26	28	31	34	36	39	42	45	49	52	55	58	61	63	66	68	71	73	75	77	79	80	82	83	85	86	87	88	89	90	90
GENERAL	29	31	34	37	40	43	46	50	53	56	59	62	65	67	70	72	74	76	78	80	81	83	84	85	87	88	88	89	90	91	91
IN SCIENCE	27	30	32	35	38	41	44	48	51	54	58	61	64	67	70	72	75	77	79	81	83	84	86	87	88	90	91	91	92	93	94
IN SOCIAL STUDIES	22	24	27	29	31	34	37	39	42	45	48	51	54	57	59	62	64	66	69	71	73	75	76	78	79	81	82	83	84	85	86
COMPREHENSION OF LITERATURE PASSAGES	33	36	39	42	45	48	51	54	57	60	63	66	68	71	73	75	77	79	81	83	84	85	87	88	89	90	90	91	92	93	93
LITERAL	34	37	40	44	47	51	54	58	61	64	68	71	74	76	79	81	83	85	86	88	89	90	92	93	93	94	95	95	96	96	97
INFERENTIAL	32	34	37	40	42	45	48	51	54	57	60	63	66	68	71	73	75	77	79	81	82	84	85	86	87	88	89	90	91	92	92
INTERPRETIVE	36	38	41	44	47	50	53	56	59	61	64	67	69	71	73	76	77	79	81	82	84	85	86	87	88	89	90	91	91	92	93
CRITICAL	24	27	29	32	35	39	42	45	49	52	56	59	62	65	68	71	74	76	78	80	82	84	85	87	88	89	90	91	92	92	93
COMPREHENSION OF SCIENCE PASSAGES	30	33	35	37	40	43	45	48	51	53	56	59	61	64	66	69	71	73	75	76	78	80	81	83	84	85	86	87	88	89	90
LITERAL	33	35	38	41	44	48	51	54	58	61	64	67	70	73	76	78	80	82	84	85	87	88	89	91	92	92	93	94	95	95	96
INFERENTIAL	31	33	35	37	40	42	45	47	49	52	54	57	59	61	63	66	68	70	71	73	75	77	78	79	81	82	83	84	85	86	87
CRITICAL	27	30	32	35	38	40	43	46	49	52	55	58	61	64	66	69	71	74	76	78	80	81	83	85	86	87	88	89	90	91	91
COMPREHENSION OF SOCIAL STUDIES	30	33	36	38	41	44	47	50	53	55	59	61	64	67	69	72	74	76	78	80	81	83	84	85	87	88	89	90	91	91	92
LITERAL	34	37	40	43	46	49	52	55	58	61	64	67	69	72	74	76	78	80	82	83	85	86	87	88	89	90	91	92	93	93	94
INFERENTIAL	30	32	34	37	39	42	44	47	50	52	55	57	60	62	65	67	69	71	73	75	77	79	80	82	83	85	86	87	88	89	90
INTERPRETIVE	32	35	38	41	44	47	51	54	58	61	65	68	71	74	76	79	81	83	85	86	88	89	90	91	92	93	93	94	95	95	95
CRITIAL	26	28	31	34	37	40	43	46	49	52	55	58	61	64	67	69	72	74	76	78	80	82	83	85	86	87	88	89	90	91	91
TOTAL READING	31	33	36	39	41	44	47	50	53	56	59	62	65	67	70	72	74	76	78	80	82	83	85	86	87	88	89	90	91	91	92

comprised of two or more elements, and (b) the population dimension, or higher-level administrative units such as school districts, counties. and the state as a whole. The final subsection considers the approximation of scale score results for subgroups within schools, such as boys and girls.

Estimating Element Scores for Individual Schools

Maximum likelihood estimates (MLEs) of scale scores from responses to calibrated items are well-known and straightforward. They require the determination of the value of θ that maximizes the likelihood function

$$p(\underline{R}_i|\underline{N}_i,\underline{\beta},\underline{\sigma},o) = \prod_j \frac{N_{ij}!}{R_{ij}!(N_{ij}-R_{ij})!} P_j(\theta)^{R_{ij}} (1-P_j(\theta))^{N_{ij}-P_{ij}} \qquad (9)$$

where

$$P_j(\theta) = \Psi[(\theta - \beta_j)/\sigma_j].$$

In practice the log of (9) is maximized. The likelihood equation is obtained by setting the first derivative of the log likelihood with respect to θ to zero:

$$0 = \sum_j [R_{ij} - N_{ij} P_j(\theta)]/\sigma_j. \qquad (10)$$

As long as a school's responses to the items of an element are neither all correct nor all incorrect, there is a unique finite value of θ that solves (10) and maximizes (9), namely, the MLE $\hat{\theta}$ (Samejima, 1969). A large sample approximation of its estimation error variation is obtained as the negative reciprocal of the second derivative of the log likelihood function with respect to θ, evaluated at $\hat{\theta}$:

$$\mathrm{Var}(\theta|\hat{\theta}) = -(\sum_j N_{ij} P_j(\theta)[1-P_j(\theta)]\sigma_j^{\,2})^{-1}. \qquad (11)$$

Strict maximum likelihood estimation of CAP scale scores proves unsatisfactory, however, because of the existence of schools with zero or perfect response vectors, for which no finite MLEs exist, and of very small schools that provide response vectors with fewer than ten responses per element, for which MLEs are highly unstable. For these reasons a more robust procedure is instead employed, using in the estimation of a given school's score in a given element information from the school's responses to items in other elements and from the average proportions of correct response to the items in that element from the state as a whole in the current assessment year.

The manner in which this collateral information is used is the imposition of a Dirichlet prior distribution on each school's vector of proportions-correct to the items in a given element (see Novick and Jackson, 1974, Section 10-7). This procedure is formally identical to augmenting the school's vectors of attempts and corrects by quantities that reflect prior (or, in the present application, collateral) beliefs as to the proportions of correct response we might expect from a given school to a given item, and the degree to which we wish these beliefs to influence the estimation of scale scores in terms of an equivalent number of observed item responses.

Now the overall proportions of correct response to items in a CAP assessment are estimated very precisely, as some 10,000 responses to each item are observed. Knowing nothing else about school i, we could use the statewide proportion of correct response to item j of element k to predict P_{ij}, the proportion of correct responses to item j from school i. That is, one could define P_{ij}^*, an estimate of P_{ij}, as the statewide proportion of correct responses to item j in the current assessment year. With the judgment that such predictions over all the items in element k should carry the weight of

1.5 observed responses, we may translate them into terms of item attempts and corrects:

$$N_{ij}^{*} = 1.5 \quad / \text{(number of items in element k)}$$

$$R_{ij}^{*} = 1.5\ P_{ij}^{*} / \text{(number of items in element k)}.$$

The responses of school i to the items in elements other than element k provide a basis for another prediction. Studies of CAP data reveal pupil-level biserial correlations between items and number-correct scores over items on the same form and from the same major content area between .4 and .8. Thus it may be predicted that schools doing relatively better or worse than average on items in elements other than k will also tend to do better or worse than average on the items in element k as well. Performing a comparison in the logit metric to avoid ceiling and floor effects, we could predict the logit of the percent-correct for item j from school i to be

$$L_{ij}^{**} = (L_{i.} - L_{..}) + L_{.j},$$

where

$L_{.j}$ = the logit of the statewide proportion of correct response to item j,

$L_{i.}$ = the logit of school i's proportion of correct response to all items in content area k, and

$L_{..}$ = the average of terms like $L_{i.}$ over schools.

These logit predictions can be translated to percents correct by

$$P_{ij}^{**} = \Psi(L_{ij}^{**}).$$

Again giving these predictions the weight of 1.5 observed item responses, we obtain

$$N_{ij}^{**} = 1.5 \;/\; (\text{number of items in element } k)$$

$$R_{ij}^{**} = 1.5\, P_{ij}^{**} / (\text{number of items in element } k).$$

School i's observed vectors of attempts and corrects are then augmented as

$$N_{ij}^{***} = N_{ij} + N_{ij}^{*} + N_{ij}^{**}$$

$$R_{ij}^{***} = R_{ij} + R_{ij}^{*} + R_{ij}^{**}.$$

The final step in the estimation of the scale score in element k requires the application of the maximum likelihood procedure described above, except with the augmented rather than observed data vectors.

Examples and further discussions of this method of estimating CAP scale scores may be found in Bock and Mislevy (1981). Suffice it to mention in this report that the use of collateral information with the weight of only three observed responses has little impact on the estimation of scale scores except in the cases of small schools (less than, say, ten responses in an element) and of perfect or near-perfect response vectors. In these cases, CAP score estimates are more in line with reasonable expectation than MLEs.

Aggregation of Results

The first way that the basic CAP scores (for individual schools in single skill elements) must be aggregated is across the skill dimension. In written language, for example, the score desired for "Word Forms" must combine results over three skill elements: suffixes, irregular noun plurals, and contractions. Along with the 29 written language element scores, 11

additional such combined area scores are reported, including a written language score that summarizes results over all 29 constituent elements.

Area scores are defined as averages over designated element scores, with each element weighted by the number of items that represent it. In this way, the weights of the various skills in an area score correspond to judgments made by CAP content area advisory committees, whose assignment of numbers of items in elements and areas reflected their relative importance. If a particular area score, then, is to be the average over K elements, it will be computed as

$$\hat{\theta}_{i.} = \sum_{k=1}^{K} N_k \hat{\theta}_{ik} / \sum_k N_k .$$

where N_k is the number of items in element k.

While each student typically responds to no more than one item per element, he or she will be responding to a selection of items from a number of different elements. Allowance must be made for the possibility of correlation among the measurement errors of the several elements, then, and provision must be made to take these error correlations into account when reporting on the precision of area scores. The formula for the measurement error variance of the area score defined above is

$$\mathrm{Var}(\hat{\theta}_{i.}|\theta_{i.}) = [\sum_k N_k \mathrm{Var}(\hat{\theta}_{ik}|\theta_{ik}) + 2\sum\sum_{k<s} N_k N_s \mathrm{Cov}(\hat{\theta}_{ik}, \hat{\theta}_{is}|\theta_{ik}, \theta_{ik})]/D$$

$$= [\sum_k N_k \mathrm{Var}(\hat{\theta}_{ik}|\theta_{ik}) + 2\sum\sum_{k<s} \rho_{ks} N_k N_s \mathrm{Var}(\hat{\theta}_{ik}|\theta_{ik}) \mathrm{Var}(\hat{\theta}_{is}|\theta_{is})]/D$$

where

$$D = \sum_k N_k$$

and ρ_{ks} is the correlation of the estimation errors of elements k and s, a quantity assumed to be constant over schools.

Estimated values of ρ_{ks} for the skill elements of the grade 6 CAP assessment are shown as Tables 7, 8, and 9. They were obtained with the split-half technique described in Mislevy and Bock (1981) and refined in Mislevy (1982), with data from the 1981-82 calibration sample of schools. It may be noted that a priori zeros are to be found as error correlations between pairs of elements that never have items appearing on the same test form.

The second way that CAP scores are aggregated is across the population dimension. A school district's score in an element or area, for example, is the average of the corresponding scores of each of its member schools, each school weighted by its number of pupils tested:

$$\hat{\theta}_{.k} = \sum_i n_i \hat{\theta}_{ik} / \sum_i n_i,$$

where $\hat{\theta}_{ik}$ is the score of school i in element or area k, n_i is the number of pupils tested in school i, and summation runs over the schools in the district of interest. Under the assumption that scores from different schools are estimated independently, the error variation of the district score is given by

$$\mathrm{Var}(\hat{\theta}_{.k} | \theta_{.k}) = \sum_i n_i \mathrm{Var}(\hat{\theta}_{ik} | \theta_{ik}) / \Sigma n_i.$$

The same formulas apply to the estimation of scores for Los Angeles administrative areas, counties, and the state as a whole.

Subgroup Reports

While reporting in California is directed principally at the level of schools and higher-level aggregations of schools, major content area results have been reported for various demographic subgroups of pupils within schools as well. Subgroup reporting categories included sex, mobility (defined as the first year that a pupil attended the school), socioeconomic level (four categories based on the occupation of the principal breadwinner), and English

TABLE 7

ERROR CORRELATIONS AMONG WRITTEN LANGUAGE ELEMENTS

		1 JUDGING	2 TOPIC	3 DETAILS	4 OUTLINE	5 VERB-USE	6 SIMPLE	7 COMPOUND	8 COMPLEX	9 CONJNCTN	10 SUBJECTS	11 PREDICATE
1	JUDGING	1.000000										
2	TOPIC	0.064681	1.000000									
3	DETAILS	-0.023180	0.057133	1.000000								
4	OUTLINE	-0.003632	0.0	0.0	1.000000							
5	VERB-USE	0.001585	0.0	0.0	0.0	1.000000						
6	SIMPLE	0.001539	-0.000248	-0.002327	0.049393	-0.002036	1.000000					
7	COMPOUND	0.000593	0.000176	0.001711	0.026187	0.055422	0.0	1.000000				
8	COMPLEX	0.001580	-0.000113	0.000760	0.031037	0.068695	0.0	0.0	1.000000			
9	CONJNCTN	0.001264	0.005424	0.0	0.0	0.0	0.080835	-0.023932	0.018067	1.000000		
10	SUBJECTS	0.001995	-0.000335	0.000427	-0.002514	0.049923	0.001268	0.027373	0.061734	0.009150	1.000000	
11	PREDICATE	0.003523	0.001603	0.002213	0.012163	0.059684	0.014977	0.085778	0.105511	0.053043	0.0	1.000000
12	FORMING	0.000127	0.001130	-0.000477	0.002001	0.037532	0.070877	0.030174	-0.022796	0.001331	0.0	0.0
13	SENSORY	0.003411	0.0	0.002830	0.0	0.0	0.004406	0.025184	0.012002	0.0	0.017788	0.056233
14	SPECIFIC	0.000416	0.0	0.0	0.086935	0.0	0.061545	0.004788	0.008990	0.0	0.005387	0.080686
15	TONE	0.004052	0.000015	0.000068	0.0	0.052890	-0.027603	-0.006223	0.079512	0.075615	-0.036308	0.044695
16	IRR-VERB	0.001779	0.0	0.0	0.109880	0.0	-0.005884	-0.019077	0.021977	0.0	0.006195	0.053553
17	PRONOUN	0.000379	0.002039	0.0	0.0	0.0	0.023416	0.012251	0.063370	0.124623	-0.043880	0.049748
18	AGREEMENT	0.000614	0.0	0.003244	0.0	0.0	-0.005340	0.044873	0.021842	0.0	-0.000681	0.098359
19	DETERMINE	0.002919	0.0	0.0	0.0	0.055523	0.003897	0.003982	0.124416	0.0	-0.067169	0.038139
20	NEGATIVE	0.001241	0.003391	0.0	0.0	0.0	0.029408	0.063760	0.032292	0.110455	-0.000036	0.074757
21	SUFFIXES	0.004005	0.0	0.0	0.0	0.020335	0.002857	-0.026248	0.134872	0.0	0.044335	0.044520
22	IRR-NOUN	0.001023	0.0	0.000214	0.0	0.0	-0.006046	0.019293	0.003540	0.0	0.045304	0.056251
23	CONTRACT	0.000116	-0.000225	-0.000797	0.010791	-0.000845	-0.038829	0.008023	0.001871	0.071422	-0.020198	0.015788
24	PREDICT	0.003496	0.000869	0.001002	0.0	0.0	0.013345	-0.036729	-0.044804	0.068883	-0.042856	0.077964
25	SPELL-SF	0.001004	-0.000084	-0.000481	0.012076	0.0	-0.010230	0.038285	0.046986	0.004794	0.034510	0.045111
26	DEMONS	0.004718	0.0	0.0	0.0	0.096029	0.036031	-0.027678	0.029756	0.0	0.050152	0.046238
27	HOMOPHONE	-0.003848	0.0	0.0	0.113265	0.0	0.003847	-0.016833	0.008448	0.0	-0.036733	0.058481
28	CAPITALS	-0.001588	0.002976	0.000000	-0.008514	0.033975	-0.004543	-0.025331	0.001549	0.067439	-0.006906	0.023751
29	PUNCUATN	0.001759	0.000322	0.002690	0.050959	0.040092	0.045519	0.068182	0.100076	0.070412	-0.021738	0.083213

(CONTINUED)

TABLE 7, CONTINUED

ERROR CORRELATIONS AMONG WRITTEN LANGUAGE ELEMENTS

		12 FORMING	13 SENSORY	14 SPECIFIC	15 TONE	16 IRR-VERB	17 PRONOUN	18 AGREEMENT	19 DETERMINE	20 NEGATIVE	21 SUFFIXES	22 IRR-NOUN
12	FORMING	1.000000										
13	SENSORY	0.021118	1.000000									
14	SPECIFIC	0.007451	0.0	1.000000								
15	TONE	0.065612	0.101583	0.0	1.000000							
16	IRR-VERB	0.027146	0.0	0.057478	0.0	1.000000						
17	PRONOUN	0.043093	0.0	0.0	0.033750	0.0	1.000000					
18	AGREEMENT	0.005319	0.063480	0.0	-0.034591	0.0	0.0	1.000000				
19	DETERMINE	0.014308	0.0	0.0	0.100947	0.0	0.0	0.0	1.000000			
20	NEGATIVE	0.065937	0.0	0.0	0.039502	0.0	0.033378	0.0	0.0	1.000000		
21	SUFFIXES	0.004993	0.0	0.0	0.101293	0.0	0.0	0.0	0.205555	0.0	1.000000	
22	IRR-NOUN	0.012808	0.078584	0.0	0.056772	0.0	0.0	0.082054	0.0	0.0	0.0	1.000000
23	CONTRACT	0.032716	0.026101	0.076009	0.049737	0.019244	0.043748	0.016323	0.023945	0.071231	0.011973	0.032662
24	PREDICATE	-0.018634	0.015672	0.0	0.036481	0.0	-0.012166	0.009035	0.0	0.044250	0.0	0.061993
25	SPELL-SF	-0.016104	-0.043890	0.031105	0.059771	0.026847	-0.024178	0.015258	0.0	0.027721	0.0	0.011936
26	DEMONS	0.046216	0.0	0.0	0.059615	0.0	0.0	0.0	0.090148	0.0	0.112537	0.0
27	HOMOPHONE	0.016669	0.0	0.079337	0.0	0.065887	0.0	0.0	0.0	0.0	0.0	0.0
28	CAPITALS	-0.002895	0.051656	0.012459	0.066069	0.026349	0.010291	0.034910	0.091891	-0.008138	-0.037363	0.019331
29	PUNCUATN	0.078721	0.096265	0.102929	0.048923	0.080341	0.049754	0.041534	0.093929	0.034130	0.063125	0.027884

		23 CONTRACT	24 PREDICT	25 SPELL-SF	26 DEMONS	27 HOMOPHON	28 CAPITALS	29 PUNCUATN
23	CONTRACT	1.000000						
24	PREDICATE	0.025382	1.000000					
25	SPELL-SF	0.033587	0.0	1.000000				
26	DEMONS	-0.007402	0.0	0.0	1.000000			
27	HOMOPHONE	0.031023	0.0	0.085350	0.0	1.000000		
28	CAPITALS	0.0	0.038192	0.026220	0.083833	0.026812	1.000000	
29	PUNCUATN	0.0	0.003086	0.021132	0.059857	0.090404	0.0	1.000000

TABLE 8

ERROR CORRELATIONS AMONG MATHEMATICS ELEMENTS

		1 COUNTING	2 PLACE VAL	3 CNPV-APP	4 ORDERING	5 CLASSIFY	6 NNP-APPL	7 ADD-WHOL	8 MUL-WHOL	9 DIV-WHOL	10 ADD-DEC	11 MUL-DEC
1	COUNTING	1.000000										
2	PLACEVAL	0.0	1.000000									
3	CNPV-APP	0.0	0.0	1.000000								
4	ORDERING	0.053846	0.046526	0.099783	1.000000							
5	CLASSIFY	0.037091	0.097313	-0.002154	-0.040573	1.000000						
6	NNP-APPL	0.018254	0.117312	0.036105	0.0	-0.055620	1.000000					
7	ADD-WHOL	0.018532	0.048172	0.011572	0.054266	0.044105	0.069908	1.000000				
8	MUL-WHOL	0.012249	0.020708	0.067258	0.072892	0.039346	0.106115	0.026245	1.000000			
9	DIV-WHOL	-0.055409	0.054577	-0.005268	0.0	0.019272	0.115344	-0.016713	-0.013723	1.000000		
10	ADD-DEC	0.085247	0.002344	0.059490	0.095754	0.034098	0.056066	0.011978	0.101085	-0.102449	1.000000	
11	MUL-DEC	0.016108	0.037571	0.053948	0.090675	0.026237	-0.054758	0.039536	0.0	-0.041221	0.0	1.000000
12	OPR-FRAC	0.022086	0.085014	-0.081104	-0.050024	-0.020491	-0.015965	0.004167	0.022114	0.025062	-0.068889	0.0
13	PERCENT	0.009605	-0.009643	0.079960	-0.006116	0.0	0.075751	0.0	-0.010280	0.107862	0.021650	0.0
14	1STEP-WH	0.012880	0.007704	0.043637	0.075308	0.057196	0.003668	0.002852	0.065100	-0.010078	0.048284	0.051654
15	1STEP-RT	0.087273	0.079497	0.048600	0.044226	0.077188	-0.015158	0.043557	0.038175	-0.048098	0.049063	0.027583
16	2STEPS	0.003195	0.054649	0.106741	0.049998	0.070581	0.000405	0.060717	0.009518	0.039896	-0.011756	0.071125
17	EQUATION	0.052060	0.085253	0.023529	0.0	-0.051614	0.121523	0.048553	0.0	0.078619	0.0	-0.032718
18	GRAPHS	0.061505	0.068496	0.023912	0.085686	0.034687	0.0	0.009975	0.036137	0.0	0.091316	0.0
19	EECG-APP	0.029848	0.030262	0.071505	0.035146	0.012215	-0.017950	-0.011093	0.041011	-0.025938	0.045408	0.077779
20	SHAPES	0.0	0.0	0.031318	-0.027455	-0.007234	0.023708	0.042456	0.056681	-0.002804	0.060468	0.031763
21	RELATION	0.0	0.108953	0.050159	0.052377	0.000489	0.006837	-0.050087	-0.050351	0.000623	-0.013907	0.053509
22	GEO-APPL	0.054886	0.050791	0.0	0.031366	-0.007355	0.058186	0.032835	0.076890	0.114205	0.049841	0.005065
23	METRIC	-0.009256	0.152719	-0.029699	-0.019442	0.069523	0.095526	0.010884	0.010483	-0.001967	0.043287	0.002752
24	US-UNITS	0.079844	0.0	-0.100559	0.019260	0.027601	0.049137	0.022302	0.011991	-0.020739	0.009419	0.008241
25	LENGTH	0.022471	0.0	0.098797	0.020838	0.057875	0.012286	0.060861	-0.003800	-0.018403	0.040730	0.052062
26	MEAS-APP	0.061530	0.018682	0.083635	-0.031028	-0.009606	0.182457	0.038205	0.054177	0.118952	0.042866	-0.014287
27	PROBABIL	0.031528	0.047306	0.005147	0.045768	0.015098	0.001350	-0.031069	0.005806	-0.008645	-0.038593	-0.000648
28	STATISTC	0.003445	0.032431	0.091854	0.005709	0.064034	0.045722	0.028805	-0.035264	0.014133	0.010506	0.027269
29	TABLES	-0.006576	0.039608	0.090915	0.062578	-0.001675	0.001256	-0.052899	0.054592	-0.047554	0.080351	0.046034
30	INTEGERS	0.066415	0.038254	-0.029876	0.093901	-0.034989	0.090089	0.039125	0.018641	0.011844	-0.033695	0.106817
31	FORMULAT	0.0	0.0	0.142388	0.043730	0.106720	-0.007484	0.095295	-0.016065	0.025921	0.012249	0.087990
32	ANALYSIS	0.061257	0.071329	0.0	0.040711	0.027713	0.067100	0.056573	0.023983	0.063139	0.000364	0.013618
33	INTERPRT	0.001056	0.019996	0.102414	0.035194	0.029996	0.032030	0.128634	0.019945	-0.012291	-0.030568	0.096129

(CONTINUED)

TABLE 8, CONTINUED

ERROR CORRELATIONS AMONG MATHEMATICS ELEMENTS

		12 OPR-FRAC	13 PERCENT	14 1STEP-WH	15 1STEP-RT	16 2STEPS	17 EQUATION	18 GRAPHS	19 EECG-APP	20 SHAPES	21 RELATION	22 GEO-APPL
12	OPR-FRAC	1.000000										
13	PERCENT	-0.117878	1.000000									
14	1STEP-WH	-0.006888	-0.000126	1.000000								
15	1STEP-RT	0.053727	-0.052480	0.074054	1.000000							
16	2STEPS	-0.057257	0.080412	0.0	0.0	1.000000						
17	EQUATION	0.039485	0.070144	0.016444	0.031871	0.043815	1.000000					
18	GRAPHS	0.016569	0.070864	-0.005117	0.025377	0.075282	0.0	1.000000				
19	EECG-APP	0.026306	-0.013342	0.059049	0.071039	0.042570	0.021005	0.0	1.000000			
20	SHAPES	0.004401	0.056144	0.056112	0.028409	0.039401	-0.038675	0.057217	0.021353	1.000000		
21	RELATION	0.023309	-0.017367	-0.005652	-0.023722	0.092289	0.045481	0.020098	0.044252	0.0	1.000000	
22	GEO-APPL	0.001420	0.022308	0.057164	0.039171	0.021990	0.053997	0.056546	0.076673	0.0	0.0	1.000000
23	METRIC	0.038182	0.019128	0.040763	0.014636	0.058981	0.096345	0.000879	0.005143	0.0	0.015034	0.071569
24	US-UNITS	0.019956	0.0	0.017086	0.066525	-0.011124	0.047296	0.050983	0.037864	-0.011603	0.0	0.017506
25	LENGTH	-0.023747	0.066848	0.099904	0.004192	0.086707	-0.000553	0.072699	0.053456	0.138760	0.0	0.000884
26	MEAS-APP	-0.025048	0.068699	0.053904	0.060678	0.008717	0.111681	0.036899	0.024337	0.025387	0.004436	0.000418
27	PROBABIL	0.010659	-0.008481	0.076051	0.069825	0.063500	0.001788	0.022256	-0.020080	0.045028	-0.037369	-0.034609
28	STATISTC	-0.034911	0.098927	0.054036	0.053111	0.073440	0.010128	0.018473	0.023378	0.022829	-0.002165	-0.007538
29	TABLES	0.057427	0.080421	0.000559	0.042465	0.084086	0.009140	0.093491	0.038224	-0.034844	0.016439	0.018103
30	INTEGERS	0.046360	0.059372	-0.034641	0.057513	0.055125	0.059940	0.0	0.135115	0.032434	0.031363	0.025461
31	FORMULAT	-0.028749	0.120595	0.116814	0.004174	0.106217	-0.029216	0.068930	0.066978	0.055710	0.011925	0.0
32	ANALYSIS	-0.014155	0.014605	0.033961	0.090809	0.060353	0.156485	0.085429	0.043481	0.0	0.071898	0.158399
33	INTERPRT	0.0	0.034862	-0.002282	0.020120	0.079434	0.0	0.004071	0.036498	0.065447	-0.023658	0.051986

		23 METRIC	24 US-UNITS	25 LENGTH	26 MEAS-APP	27 PROBABIL	28 STATISTC	29 TABLES	30 INTEGERS	31 FORMULAT	32 ANALYSIS	33 INTERPRT
23	METRIC	1.000000										
24	US-UNITS	0.000284	1.000000									
25	LENGTH	-0.009393	0.068698	1.000000								
26	MEAS-APP	0.077222	0.019927	-0.051705	1.000000							
27	PROBABIL	0.018377	0.005933	0.103588	-0.025019	1.000000						
28	STATISTC	0.116263	-0.018770	0.073838	-0.012396	0.0	1.000000					
29	TABLES	0.059864	0.045903	0.081130	-0.049649	0.074087	0.068852	1.000000				
30	INTEGERS	0.068971	0.008019	0.035671	-0.009793	0.056279	-0.047101	0.0	1.000000			
31	FORMULAT	0.021419	0.005875	0.094377	0.007568	0.042097	0.056085	0.099026	0.108872	1.000000		
32	ANALYSIS	0.077112	0.058432	0.006689	0.024690	0.071475	0.037696	0.061867	0.092487	0.0	1.000000	
33	INTERPRT	0.022336	0.002316	0.122129	-0.025622	-0.017452	0.024476	0.057138	0.075932	0.087992	0.027378	1.000000

TABLE 9

ERROR CORRELATIONS AMONG READING ELEMENTS

		1 P-S-R	2 GENVOCAB	3 SCIVOCAB	4 SS-VOCAB	5 CONTEXT	6 1SENTENC	7 2SENTENC	8 PRONOUN	9 SEQUENCE	10 MAINIDEA	11 CAUSE-EF
1	P-S-R	1.000000										
2	GENVOCAB	0.051230	1.000000									
3	SCIVOCAB	0.082741	0.0	1.000000								
4	SS-VOCAB	0.062187	0.0	0.0	1.000000							
5	CONTEXT	0.073485	0.083883	0.081897	0.074478	1.000000						
6	1SENTENC	0.125141	0.097182	0.083643	0.148395	0.110326	1.000000					
7	2SENTENC	0.104398	0.000220	0.066725	0.055429	0.032225	0.095394	1.000000				
8	PRONOUN	0.033163	0.083035	0.100298	0.050898	0.099879	0.132977	0.035140	1.000000			
9	SEQUENCE	0.069774	0.071345	0.040547	0.046180	0.091[illegible]5	0.075583	0.073287	0.08567	.000000		
10	MAINIDEA	0.[illegible]7847	0.002030	0.044974	0.060358	0.097354	0.047664	0.169719	0.0943 ·	0.087837	1.000000	
11	CAUSE-EF	0.056042	0.023868	0.131007	0.111254	0.072228	0.074605	0.150823	0.0[illegible]50	0.001166	0.088273	1.000000
12	ORGANIZE	0.100945	0.009051	0.091554	0.047926	0.073101	0.032466	0.1[illegible]7353	-0.064832	0.036667	0.110229	0.077710
13	PUT-INFO	0.081117	0.071136	0.028351	0.037553	0.133170	0.043974	0.132396	0.097528	0.071148	0.157676	0.054378
14	PREDICT	0.014785	0.051694	0.042645	0.059658	0.108302	0.048275	0.029673	0.117271	0.046659	0.048979	0.075003
15	COMPARE	0.076919	0.041977	0.050116	0.039490	0.035848	0.063418	0.080814	0.092857	0.074195	0.067230	0.001023
16	CONC-DET	0.125336	0.095550	0.067571	0.125009	0.098462	0.072552	0.108495	0.022242	0.068560	0.029351	0.046447
17	CONC-MNG	0.049936	0.023068	0.075783	0.047786	0.074939	0.005280	0.070183	0.100674	0.061907	0.041626	0.151964
18	CHARACTR	0.052203	0.058466	0.0	0.061442	0.014552	0.074527	0.158665	0.07319	0.096189	0.016152	0.106370
19	SETTING	0.037224	0.147634	0.0	0.003703	0.092848	0.037875	0.068779	0.067607	0.060632	0.009388	0.037432
20	SUMMARIZ	0.079164	0.163414	0.0	0.000330	0.105619	0.015666	0.083931	0.048991	0.051839	-0.030845	0.0675
21	DIALOGUE	0.034768	0.144917	0.0	0.034107	0.095696	0.054317	0.041455	0.077145	0.084667	0.006742	0.011[illegible]
22	MOOD	0.004428	0.122871	0.0	0.088497	0.130812	0.059596	0.073706	-0.016589	0.052094	0.084362	-0.002[illegible]
23	FIGURTV	0.092457	0.042602	0.009480	0.014013	0.044104	0.015430	0.051335	0.082063	0.071683	0.118743	0.053873
24	ATTITUDE	0.037234	0.098490	0.017079	0.062077	0.114199	0.066398	0.031616	0.071955	0.090331	0.085672	0.055255
25	PURPOSE	0.025029	0.012191	0.042[illegible]	-021863	0.045563	0.056997	0.061741	0.080631	0.028790	0.188908	0.079314
26	FACT/OPN	0.094185	0.028090	0.10329.	053781	0.124007	0.055981	0.024672	0.084064	0.060229	0.123286	0.113968
27	CONTEXT	0.045068	0.007463	0.045236	0.050633	0.047834	0.063048	0.103035	0.052171	0.111064	0.071809	0.116772
28	REFERENC	0.000869	0.043898	-0.009901	0.045322	-0.003657	-0.002348	0.033538	0.010634	0.031886	0.027546	0.017131
29	MAPS	0.041680	0.025594	-0.034689	0.056832	0.048197	-0.026629	0.043764	-0.011010	0.015213	0.037514	0.018565
30	LIT-LIT	0.123144	0.150418	0.0	0.0	0.051768	0.331008	0.094701	0.340373	0.195016	0.000439	-0.000865
31	LIT-INFR	0.144612	0.095987	0.0	0.005213	0.169279	0.023058	0.106725	0.064495	-0.004166	0.022929	0.279318
32	LIT-INTR	0.071907	0.224825	0.0	0.042681	0.137405	0.055562	0.107240	0.125511	0.101305	0.027323	0.092004
33	LIT-CRIT	0.028799	0.129876	0.0	0.0	0.115888	0.106463	0.002876	0.081424	0.059275	0.0	0.009979
34	SCI-LIT	0.111193	0.063193	0.115147	0.0	0.120343	0.283913	0.149236	0.183240	0.248797	0.129756	0.138609
35	SCI-INFR	0.086318	0.048366	0.207325	0.0	0.103406	0.047112	0.043006	0.065658	0.011815	0.281077	0.213349
36	SCI-CRIT	0.084411	0.04623e	0.170088	0.0	0.127588	0.018038	0.046041	0.072161	0.086163	0.156844	0.089067
37	SS-LIT	0.039407	0.016909	0.0	0.163843	0.065395	0.309189	0.486924	0.232625	0.454873	0.158054	0.045912
38	SS-INFR	0.080555	0.004704	0.0	0.207654	0.095780	0.095125	0.269513	0.105703	0.135754	0.287056	0.153991
39	SS-INTRP	0.060709	0.002593	0.0	0.180801	0.002057	0.109948	0.210481	-0.027331	0.093847	0.086656	0.062720
40	SS-CRIT	0.054413	-0.011941	0.0	0.129939	0.062033	0.101842	0.081566	0.084144	0.080621	0.109079	0.082890

(CONTINUED)

TABLE 9, CONTINUED

ERROR CORRELATIONS AMONG READING ELEMENTS

		12 ORGANIZE	13 PUT-INFO	14 PREDICT	15 COMPARE	16 CONC-DET	17 CONC-MNG	18 CHARACTR	19 SETTING	20 SUMMARIZ	21 DIALOGUE	22 MOOD
12	ORGANIZE	1.000000										
13	PUT-INFO	0.027473	1.000000									
14	PREDICT	0.122747	0.104638	1.000000								
15	COMPARE	-0.000920	0.000194	0.020501	1.000000							
16	CONC-DET	0.082331	0.130429	0.053941	0.109147	1.000000						
17	CONC-MNG	0.055702	0.066397	0.060639	-0.021806	0.090141	1.000000					
18	CHARACTR	0.031564	0.043307	0.038173	0.087182	0.062596	0.101272	1.000000				
19	SETTING	0.0	0.029195	0.049822	0.075589	0.053209	-0.004557	0.121888	1.000000			
20	SUMMARIZ	0.0	0.010948	0.058759	0.100927	0.091571	0.041619	0.181535	0.175605	1.000000		
21	DIALOGUE	-0.026280	0.086959	0.123929	0.064826	0.050273	0.044223	0.096322	0.123267	0.248149	1.000000	
22	MOOD	0.059116	0.064930	0.026401	0.026752	0.088698	0.038914	0.092739	0.128628	0.157333	0.081614	1.000000
23	FIGURTV	0.091853	0.069220	0.062290	0.122828	0.087440	0.061459	0.040574	0.086126	0.083274	0.059678	0.010377
24	ATTITUDE	0.031242	0.016016	0.073986	0.148195	0.042612	0.047182	0.126218	0.150584	0.065716	0.165723	0.064008
25	PURPOSE	0.036915	0.050803	0.052676	0.038095	0.041643	0.128094	-0.019507	-0.031503	0.088282	0.083048	0.063916
26	FACT/OPN	0.030346	0.064091	0.083939	0.081791	0.148198	0.076193	-0.059712	0.0	0.0	0.052846	0.018350
27	CONTEXT	0.065794	0.064987	0.106410	0.023721	0.103774	0.108310	0.089624	0.0	0.0	0.018363	0.005632
28	REFERENC	0.032583	0.021595	0.041481	0.051896	0.085681	0.051332	-0.018939	0.032657	0.057610	0.087691	0.063576
29	MAPS	-0.012137	0.092000	-0.041240	0.056848	0.033689	0.005212	0.047094	0.060441	0.075111	0.107322	0.108105
30	LIT-LIT	0.0	0.030154	0.031027	-0.013640	0.025733	0.036523	0.103781	0.085814	0.156576	0.119461	0.049557
31	LIT-INFR	0.0	0.073416	0.189467	0.215552	0.153385	0.150762	0.221308	0.203304	0.329324	0.182229	0.223625
32	LIT-INTP	0.0	0.050180	0.074184	0.168329	0.101276	0.067902	0.437114	0.495262	0.574074	0.473531	0.432383
33	LIT-CRIT	0.0	0.033673	-0.006166	0.052373	0.005429	0.042952	0.033462	0.135521	0.167910	0.161363	0.106188
34	SCI-LIT	0.027548	0.077831	0.065339	0.103582	0.083571	0.062312	0.0	0.0	0.0	0.0	0.0
35	SCI-INFR	0.311027	0.222576	0.293287	0.118050	0.282933	0.254237	0.0	0.0	0.0	0.0	0.0
36	SCI-CRIT	0.139342	0.053187	0.102759	0.102521	0.158966	0.056638	0.0	0.0	0.0	0.0	0.0
37	SS-LIT	0.103174	0.142314	0.098487	0.087790	0.068186	0.037811	0.160329	0.0	0.0	0.057018	0.069676
38	SS-INFR	0.312406	0.311025	0.240153	0.112441	0.245114	0.170720	0.108063	0.0	0.0	-0.003688	0.055185
39	SS-INTRP	0.124788	0.050266	0.051059	0.000459	0.001344	0.006236	0.452635	0.0	0.0	-0.001783	0.157783
40	SS-CRIT	-0.012472	0.076979	0.076595	0.028541	0.044672	0.070739	0.152799	0.0	0.0	0.025644	0.040917

(CONTINUED)

TABLE 9, CONTINUED

ERROR CORRELATIONS AMONG READING ELEMENTS

		23 FIGURTV	24 ATTITUDE	25 PURPOSE	26 FACT/OPN	27 CONTEXT	28 REFERENC	29 MAPS	30 LIT-LIT	31 LIT-INFR	32 LIT-INTR	33 LIT-CRIT
23	FIGURTV	1.000000										
24	ATTITUDE	0.166570	1.000000									
25	PURPOSE	0.051055	0.032702	1.000000								
26	FACT/OPN	0.055393	0.094404	0.065731	1.000000							
27	CONTEXT	0.048848	0.060907	0.141361	0.138301	1.000000						
28	REFERENC	0.054585	0.031870	0.080048	0.037662	-0.023032	1.000000					
29	MAPS	0.095198	0.031354	-0.018943	0.006187	-0.023809	0.047019	1.000000				
30	LIT-LIT	0.076019	0.089020	0.015376	0.0	0.0	0.027842	0.045954	1.000000			
31	LIT-INFR	0.048414	0.115807	0.037485	0.0	0.0	0.022728	0.057001	0.098638	1.000000		
32	LIT-INTR	0.199279	0.209875	0.044198	0.0	0.0	0.075334	0.141468	0.210315	0.455132	1.000000	
33	LIT-CRIT	0.104679	0.425017	0.339688	0.0	0.0	0.068362	0.042988	0.138406	0.185473	0.221364	1.000000
34	SCI-LIT	0.037201	0.048079	0.091396	0.148108	0.067686	0.016932	-0.005981	0.0	0.0	0.0	0.0
35	SCI-INFR	0.130325	0.063676	0.135953	0.211700	0.070801	0.086031	-0.060383	0.0	0.0	0.0	0.0
36	SCI-CRIT	0.003292	0.110544	0.289439	0.496377	0.248166	0.029008	-0.052152	0.0	0.0	0.0	0.0
37	SS-LIT	0.079721	0.059795	0.071155	0.045323	0.129092	-0.009236	0.008778	0.0	0.0	0.0	0.0
38	SS-INFR	0.058136	0.055867	0.067332	0.102123	0.143813	0.011265	0.023010	0.0	0.0	0.0	0.0
39	SS-INTRP	0.109220	0.046557	-0.041609	0.014468	0.094018	-0.056250	0.035496	0.0	0.0	0.0	0.0
40	SS-CRIT	0.035173	0.236487	0.135287	0.340350	0.377961	-0.023277	0.021149	0.0	0.0	0.0	0.0

		34 SCI-LIT	35 SCI-INFR	36 SCI-CRIT	37 SS-LIT	38 SS-INFR	39 SS-INTRP	40 SS-CRIT
34	SCI-LIT	1.000000						
35	SCI-INFR	0.191367	1.000000					
36	SCI-CRIT	0.248768	0.349842	1.000000				
37	SS-LIT	0.0	0.0	0.0	1.000000			
38	SS-INFR	0.0	0.0	0.0	0.323379	1.000000		
39	SS-INTRP	0.0	0.0	0.0	0.274190	0.236592	1.000000	
40	SS-CRIT	0.0	0.0	0.0	0.202611	0.265692	0.201595	1.000000

language fluency (English only, fluent English plus another language, limited English). Prior to the 1981-82 assessment, grade 6 subgroup results were reported in the percent-correct metric. Beginning in 1981-82, they are reported in the scale-score metric.

Because subgroups within schools represent a level of aggregation lower than that at which the CAP measurement model is defined, namely schools, rigorous estimates of subgroup attainment are not forthcoming from the model. Approximations are instead computed from observed content-area percent-correct results in the various subgroup categories.

This was accomplished in 1981-82 by means of tables like those appearing as Tables 4-6 in this report, recording expected percent-correct scores given a flat profile of content-area scale scores. The required tables were constructed in two steps. First, the expected percent-correct score in a major content area was computed for flat scale score profiles ranging from 0 to 500 in steps of 5 scale score units. Second, logistic interpolation was performed to fill in a correspondence table between scale scores and percents-correct for all percents-correct between zero and one in steps of .001. A floor of zero and a ceiling of 500 were imposed on the scale-score entries in this table. Each subgroup category's percent-correct content area score was transformed via such a table to the scale-score metric.

The primary advantage of this procedure is that it can easily accommodate changes in the assessment instrument in forthcoming years. As new items are calibrated into the instrument and old ones are dropped, the corresponding item parameters are either included into or dropped from the computation of expected percent correct scores given scale scores, and a new table of correspondence is generated--without resort to or dependence on the distribution of attainment in any year or any population. This is in contrast

to the method of translation based on a line of best fit between scale scores and logits of percents-correct which would change not only with changes in item parameters but with changes in the population distribution of attainment.

The primary disadvantage of this IRT procedure is that it applies a regression function in the wrong direction. What would be desired is not the θ that has the observed P as its expectation, but the expected value of θ given the observed P. Unfortunately the correct regression cannot be obtained without resort to empirical evidence based on joint distributions of θ and P that vary over time, while the incorrect regression can be computed analytically via the measurement model and a convention of using flat score profiles. The consequences of using the wrong regression function are mitigated by the strength of the relationship between scale scores and logits of percent correct; correlations between these values exceed .99 in all three content areas. For the bulk of the distribution, there is little difference among the two regressions and the line of best relationship.

The practical problem arises with any translation of subgroup results based on the relationship of school-level scale scores and percents-correct, that there is no guarantee that appropriately weighted averages of subgroup categories will equal the corresponding area scale score of the unit they comprise; e.g., the school, district, or state. It is possible, for example, to find that the scale score equivalents of the male and female percents-correct in a school may both be above (or both be below) the school score.

As a remedy to this anomaly, an additional step in computing subgroup scores is recommended. As before, the percents-correct of all subgroups in a given reporting category will be translated to the scale score metric via an IRT correspondence table. Then, additionally, the weighted average scale score of all the subgroups in the category will be computed, and the difference between that weighted average and the school scale score will be

subtracted from each subgroup score, so that the weighted average of the adjusted subgroup scores will equal the school score. This procedure must be carried out separately for each subgroup type. The distances between males and females, say, will have thus been obtained from the correspondence tables, but the absolute levels of these subgroup scores will have been adjusted so as to provide aggregability of subgroup scores within schools. Aggregability of subgroup scores for districts, counties, and the state as a whole are also guaranteed; for example, the weighted average of the male scores for all schools and the weighted average of the females scores for all schools will themselves yield a weighted average equal to the state average for all schools. This adjustment, if used in conjunction with IRT correspondence tables, provides aggregability without sacrificing the ability to adapt to changes in the assessment instrument.

EQUATING THE 1981-82 GRADE 6 ASSESSMENT TO PREVIOUS ASSESSMENTS

The 1981-82 CAP grade 6 assessment introduced a new assessment instrument as well as a new measurement model. For trend analyses of grade 6 results over recent years to be made, equating procedures were necessary to translate school level results in the percent-correct scales of the previous assessment instrument into scale score results in the new assessment instrument. To this end, forms of the previous assessment were administered concurrently with new assessment, administered randomly to a 2 percent sample of grade 6 students, spiralled in with the new assessment forms so that the equating study was based on a random sample of students representative of the entire population. This section describes the procedures used to set the scale of the 1981-82 assessment and to translate results from previous assessments to this scale.

Determining the Scale and Origin for 1981-82 Scale Scores

When scale score reporting was introduced to the CAP grade 3 assessment in 1979-80, the scale and unit of the scores were set by requiring the statewide mean and standard deviation of school scores, each weighted by its number of pupils tested, to be 250 and 50, respectively, in all skill elements. Since results in higher-level skill areas such as reading as a whole are averages over elements (as described in the section on scoring procedures), the content area weighted averages in reading, mathematics, and written language were 250 as well. It was determined that the scale of the new grade 6 assessment instrument be set in such a manner as to make back-equated estimates of the 1979-80 grade 6 average to 250 in the three major content areas also. The steps undertaken to finalize grade 6 scale scores under this requirement are as follows:

1. As noted in the section on item calibration, item parameters in each element were estimated on a provisional scale under which the calibration sample of schools had a latent mean of zero and a latent standard deviation of one.

2. Using the item parameters on the provisional (0,1) latent scale, scores were estimated for all schools in all elements via the procedures described in the section on element-level school score estimation.

3. A second provisional scale was established in each element by linearly transforming all school scores so as to make the statewide observed score weighted mean 250 and standard deviation 50. Let this transformation for element k be denoted as $M_k\theta + X_k$.

4. Because the skill elements in the new 1981-82 assessment do not fall into one-to-one correspondence with the reporting categories of the old assessment, the equating of the new and old assessment instruments was carried out at the level of the three major content areas. Each school's 1981-82 content area scale scores were computed on the (250,50) provisional scale by averaging its results in the elements in that area, with each element weighted by its number of items.

5. The equipercentile method was used to create tables of correspondence between school-level content-area scale scores and content-area percent-correct scores on the new assessment. Details of this equating study are given in a following section of this report.

6. The equipercentile method was used to construct tables of correspondence between pupil-level percent-correct scores on the old assessment and pupil-level scores on the new assessment, on the basis of results from the concurrent 1981-82 administration of both instruments. One such table was created for each of the three major content areas. Because forms are approximately parallel within both the new and old assessments, these tables of correspondence represented an average over forms. Because school-level percents-correct are simply averages of pupil-level percents correct, these tables were taken to represent the correspondence between school-level percent-correct results on the new and old assessment instruments as well. Details of this study are also given in a following section.

7. The tables created in steps 5 and 6 were combined to produce, for each of the three major content areas, tables of correspondence between school-level scale scores in the new assessment and school-level percent-correct results in the old assessment.

8. The 1979-80 distribution of school-level percents-correct in each major content area was transformed to a distribution of scale scores, on the provisional (250,50) scale by using the tables created in step 7.

9. The content area weighted mean of the 1979-80 statewide distribution, as approximated in step 8, was determined. Let μ_r denote this value for content area r. The final transformation for a school's score for element k in content area r, from the provisional (0,1) calibration scale to the final scale, is then given by

$$\theta \dashrightarrow M_r \theta + X_k + (250-\mu_r).$$

The value $250-\mu_r$ represents the average gain from 1979-80 to 1981-82 in content area r in scale score units based on standard deviations of 50 in all elements in 1981-82. The values of μ_r for reading, mathematics, and written language were 4.021, 7.810, and 6.603.

Item parameter estimates and associated standard errors from element k in content area r were transformed accordingly to the final scale. The transformations are as follows:

$$\beta_j \text{ --> } M_k \beta_j + X_k + (250 - \mu_r)$$

$$SE(\beta_j) \text{ --> } M_k SE(\beta_j)$$

$$\sigma_j \text{ --> } M_k \sigma_j$$

$$SE(\sigma_j) \text{ --> } M_k SE(\sigma_j).$$

The statewide change scores discussed above were incorporated into the correspondence tables created in step 7 to produce an equating between school-level percents correct on the old assessment instrument and school-level scale scores on the new assessment instrument. Values for 1979-80 and 1980-81 results were recorded on each school's 1981-82 reports to permit analyses of three years of results in the new scale units.

Equating 1982 School-Level Scale Scores with 1982 School-Level Percent-Correct Scores

In the preceding section, reference was made to an equipercentile equating carried out for 1982 school-level scale-scores and percent-correct scores. Details of this process are now described.

For each content area, weighted distributions of percent-correct scores, designated as X, and provisional scale scores, designated Y, were obtained for the entire population of schools. Then, for selected values X_ℓ spaced throughout the range of the observed percent-correct scale, the corresponding values Y_ℓ were computed as the points along the Y scale with the same percentile ranks as their X_ℓ counterparts. The ordered pairs (X_ℓ, Y_ℓ) were plotted, and a smooth equipercentile curve was drawn through the points to represent the relationship between X and Y at every point on the two scales.

Tables of correspondence between percent-correct and scale scores were constructed from linear parameters computed from successive segments of the equipercentile curve. They were derived in such a way as to yield a good fit of the equipercentile curve with the line segments. The linear parameters for computing the tables of correspondence for converting school-level percent correct content area scores on the 1982 instrument to school-level content area scale scores are given as Table 10.

Equating 1975 Instrument Pupil-Level Percent-Correct Scores with 1982 Instrument Pupil-Level Percent-Correct Scores

Also referenced in a preceding section was an equipercentile equating of pupil-level percent-correct scores on the old (1975) and new (1982) assessment instruments. Details of that procedure are given in this section.

Frequency distributions of percent-correct scores for each content area were first computed for a 2-percent random sample of the grade 6 pupils who were administered the 1975 instrument in 1982, then for the remaining 98 percent who were administered the 1982 instrument. For every observed percent-correct score X_ℓ on the 1975 instrument, the equivalent percent-correct score Y_ℓ on the 1982 instrument was computed as that point on the Y scale having the same percentile rank as X_ℓ. Corresponding pairs of percent-correct values (X_ℓ, Y_ℓ) were plotted, and a smooth equipercentile line was drawn through the points.

As anticipated, because of the similarity in the shapes of the two distributions, the smooth line representing the relationship between percent-correct scores on the two instruments was essentially a straight line. Furthermore, the equipercentile line coincided to a high degree with the straight line obtained through linear equating. Accordingly, the linear equating parameters given in Table 11, as computed from the means and standard

TABLE 10

LINEAR EQUATING PARAMETERS FOR CONVERTING 1982 SCHOOL-LEVEL PERCENT-CORRECT SCORES TO SCALED SCORES

SCALED SCORE = A(PERCENT-CORRECT) + B

READING

RANGE OF SCORES %-CORRECT	RANGE OF SCORES SCALED SCORE	CONVERSION PARAMETERS A	CONVERSION PARAMETERS B
12.1 - 57.2	120 - 190	2.9536	25.0753
57.2 - 72.7	190 - 250	3.8710	-27.4005
72.7 - 80.7	250 - 290	5.0000	-109.4790
80.7 - 86.2	290 - 330	7.2727	-292.8858
86.2 - 95.5	330 - 420	9.6774	-500.1708
95.5 -100.0	420 - 513	20.6667	-1549.6490

WRITTEN LANGUAGE

RANGE OF SCORES %-CORRECT	RANGE OF SCORES SCALED SCORE	CONVERSION PARAMETERS A	CONVERSION PARAMETERS B
38.2 - 58.5	150 - 190	3.2000	9.4030
58.5 - 72.2	190 - 240	3.6496	-16.8983
72.2 - 80.9	240 - 285	5.1724	-126.8443
80.9 - 88.2	285 - 335	6.8493	-262.5053
88.2 - 97.3	335 - 420	9.3407	-482.2469
97.3 -100.0	420 - 481	22.5926	-1771.6570

MATHEMATICS

RANGE OF SCORES %-CORRECT	RANGE OF SCORES SCALED SCORE	CONVERSION PARAMETERS A	CONVERSION PARAMETERS B
25.0 - 47.4	150 - 190	4.0000	8.2100
47.4 - 65.8	190 - 260	3.8043	17.4867
65.8 - 76.5	260 - 310	4.6729	-39.6668
76.5 - 85.4	310 - 360	5.6180	-111.9670
85.4 - 90.2	360 - 405	9.3750	-432.6250
90.2 -100.0	405 - 421	1.6327	265.5403

TABLE 11

SUMMARY STATISTICS FOR SAMPLES USED TO EQUATE 1975 PUPIL-LEVEL PERCENT-CORRECT SCORES WITH 1982 PUPIL-LEVEL PERCENT-CORRECT SCORES

READING

	1975 FORMS	1982 FORMS
N	6383	293,281
MEAN	68.4230	71.5029
SD	25.1289	23.5041
SKEW	-.594	-.606

1982 %-CRRT = .9353 (1975 %-CRRT) + 7.5069

WRITTEN LANGUAGE

	1975 FORMS	1982 FORMS
N	6383	293,281
MEAN	62.2179	3.2850
SD	24.3770	19.5165
SKEW	-.631	-.534

1982 %-CRRT = .8006 (1975 %-CRRT) + 19.4703

MATHEMATICS

	1975 FORMS	1982 FORMS
N	6383	293,281
MEAN	61.6074	62.6448
SD	20.3353	21.3775
SKEW	-.162	-.160

1982 %-CRRT = 1.0513 (1975 %-CRRT) - 2.1231

deviations of the distributions from the 1975 and 1982 instruments in each respective content area, were used to equate pupil-level percent-correct scores on the two instruments.

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APPENDIX A

CALIBRATION OF ELEMENT "CLASSIFICATION OF NUMBERS": ONE- AND TWO-PARAMETER LOGISTIC MODELS

B I L O G
MAXIMUM LIKELIHOOD ITEM ANALYSIS AND TEST SCORING: LOGISTIC MODEL

DISTRIBUTED BY

INTERNATIONAL EDUCATIONAL SERVICES, INC.
CHICAGO, ILLINOIS

*** LOGISTIC MODEL ITEM ANALYSER ***

CALIBRATION OF GRADE 6 MATH ELEMENT CLASSIFY 1-PARAMETER MODEL 8/82 RJM

LOGISTIC METRIC (I.E., D=1.0)

NUMBER OF SUBTESTS: 1

SUBTEST LENGTHS:
20

SAMPLE SIZE: 1000 OBSERVATIONS

ITEM STATISTICS FOR SUBTEST CLASSIFY

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT	ITEM#TEST CORRELATION PEARSON	BISERIAL
1	0001	1798.0	1409.0	0.784	1.29	0.693	#####
2	0002	1804.0	1508.0	0.836	1.63	0.681	#####
3	0003	1867.0	1248.0	0.668	0.70	0.655	#####
4	0004	1809.0	993.0	0.549	0.20	0.601	#####
5	0005	1786.0	565.0	0.316	-0.77	0.500	#####
6	0006	1838.0	1588.0	0.864	1.85	0.690	#####
7	0007	1837.0	1120.0	0.610	0.45	0.652	#####
8	0008	1805.0	1332.0	0.738	1.04	0.650	#####
9	0009	1822.0	1201.0	0.659	0.66	0.649	#####
10	0010	1787.0	986.0	0.552	0.21	0.649	#####
11	0011	1768.0	1116.0	0.631	0.54	0.635	#####
12	0012	1795.0	271.0	0.151	-1.73	0.401	#####
13	0013	1857.0	605.0	0.326	-0.73	0.513	#####
14	0014	1818.0	1365.0	0.751	1.10	0.669	#####
15	0015	1789.0	1532.0	0.856	1.79	0.693	#####
16	0016	1764.0	1013.0	0.574	0.30	0.620	#####
17	0017	1822.0	302.0	0.166	-1.62	0.405	#####
18	0018	1804.0	980.0	0.543	0.17	0.626	#####
19	0019	1816.0	649.0	0.357	-0.59	0.512	#####
20	0020	1817.0	887.0	0.488	-0.05	0.587	#####

NUMBERS OF FRACTILES OR QUAD POINTS BY SUBTEST:
10

CALIBRATION OF SUBTEST

CLASSIFY

QUADRATURE POINTS AND PRIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4000D+01	-0.3111D+01	-0.2222D+01	-0.1333D+01	-0.4444D+00	0.4444D+00	0.1333D+01	0.2222D+01	0.3111D+01	0.4000D+01
WEIGHT	0.1190D-03	0.2805D-02	0.3002D-01	0.1458D+00	0.3213D+00	0.3213D+00	0.1458D+00	0.3002D-01	0.2805D-02	0.1190D-03

-2 LOG LIKELIHOOD = 41931.647
CYCLE 1; LARGEST CHANGE= 0.06350

-2 LOG LIKELIHOOD = 41913.257
CYCLE 2; LARGEST CHANGE= 0.02462

-2 LOG LIKELIHOOD = 41907.003
CYCLE 3; LARGEST CHANGE= 0.01477

-2 LOG LIKELIHOOD = 41904.677
CYCLE 4; LARGEST CHANGE= 0.01803

-2 LOG LIKELIHOOD = 41903.386
CYCLE 5; LARGEST CHANGE= 0.00434

INTERVAL COUNTS OF TRIES AND ATTEMPTS FOR COMPUTATION OF ITEM CHI-SQUARES

AVRGE THETA>>	-2.43	-1.84	-1.39	-0.85	-0.30	0.28	0.78	1.49	1.96	2.70
ITEM 0001										
TRIED	108	116	150	240	280	321	259	162	81	78
RIGHT	48	73	108	188	221	263	225	141	71	68
EXPECTED	62	74	102	175	217	262	219	143	73	72
ITEM 0002										
TRIED	101	112	151	239	296	290	268	152	105	90
RIGHT	59	80	118	184	248	252	247	142	93	85
EXPECTED	66	80	113	189	245	250	237	139	97	85
ITEM 0003										
TRIED	108	111	156	237	301	311	269	170	106	95
RIGHT	48	51	80	134	199	218	203	140	90	82
EXPECTED	45	54	83	140	195	219	201	136	88	83

ITEM 0004										
TRIED	104	109	165	228	282	336	248	166	89	79
RIGHT	26	36	62	103	156	189	135	122	71	70
EXPECTED	31	39	67	105	147	196	158	117	66	63
ITEM 0005										
TRIED	97	113	143	234	295	296	262	151	106	89
RIGHT	13	11	16	42	81	93	118	67	60	64
EXPECTED	13	19	28	55	83	100	101	70	55	53
ITEM 0006										
TRIED	109	113	168	238	300	339	260	154	110	95
RIGHT	70	82	136	196	260	259	239	144	107	93
EXPECTED	77	85	133	197	257	256	236	143	104	91
ITEM 0007										
TRIED	109	110	154	243	294	304	254	165	106	93
RIGHT	28	46	66	123	194	190	184	123	87	74
EXPECTED	39	46	72	128	172	196	176	125	84	78
ITEM 0008										
TRIED	107	108	161	230	289	333	251	155	91	77
RIGHT	56	62	103	155	209	255	208	134	78	69
EXPECTED	54	62	100	155	209	257	203	132	80	70
ITEM 0009										
TRIED	103	116	166	234	281	337	250	162	89	81
RIGHT	47	54	93	131	176	237	186	135	69	70
EXPECTED	42	55	67	136	180	235	185	129	74	70
ITEM 0010										
TRIED	105	119	145	232	276	316	259	163	88	80
RIGHT	27	43	53	103	147	198	167	116	63	66
EXPECTED	32	43	59	108	145	186	166	115	66	64

INTERVAL COUNTS OF TRIES AND ATTEMPTS FOR COMPUTATION OF ITEM CHI-SQUARES

AVRGE THETA>>	-2.43	-1.84	-1.39	-0.85	-0.30	0.28	0.78	1.47	1.96	2.70
ITEM 0011										
TRIED	103	114	153	225	280	312	253	152	92	83
RIGHT	57	52	81	131	177	207	172	112	73	63
EXPECTED	39	51	75	124	171	208	181	118	74	71
ITEM 0012										
TRIED	99	110	158	223	301	306	258	165	90	84
RIGHT	9	9	8	19	27	48	47	53	24	37
EXPECTED	5	8	13	23	39	49	49	40	26	30
ITEM 0013										
TRIED	110	112	167	235	304	306	262	157	107	94
RIGHT	15	19	34	51	84	106	104	67	59	63
EXPECTED	15	19	34	58	89	106	105	75	56	57
ITEM 0014										
TRIED	104	111	154	236	294	314	275	158	94	78
RIGHT	65	71	109	165	221	244	218	126	79	67
EXPECTED	55	65	98	162	217	246	225	136	83	71
ITEM 0015										
TRIED	102	112	154	221	283	305	276	158	96	82
RIGHT	64	89	112	183	242	270	249	151	92	80
EXPECTED	70	83	120	180	240	268	249	146	90	78

ITEM 0016 :										
TRIED	: 98	107	154	219	290	308	258	160	88	80
RIGHT	: 29	37	55	105	161	192	181	108	72	72
EXPECTED	: 32	41	66	107	159	188	170	116	67	65
ITEM 0017 :										
TRIED	: 105	114	152	224	293	315	276	157	100	85
RIGHT	: 13	13	16	27	39	42	49	39	35	2[illegible]
EXPECTED	: 6	9	14	26	41	55	58	42	31	32
ITEM 0018 :										
TRIED	: 102	109	153	237	296	302	271	148	98	88
RIGHT	: 25	32	64	117	145	181	162	104	79	71
EXPECTED	: 30	38	61	108	152	174	171	103	73	70
ITEM 0019 :										
TRIED	: 103	108	157	241	290	318	263	164	89	83
RIGHT	: 24	31	42	69	80	120	109	84	43	47
EXPECTED	: 16	21	36	66	94	122	115	84	50	53
ITEM 0020 :										
TRIED	: 104	11[illegible]	162	227	297	320	265	152	92	84
RIGHT	: 32	34	59	105	128	175	145	100	56	53
EXPECTED	: 26	34	56	91	136	167	153	99	64	64

SUBTEST CLASSIFY; ITEM PARAMETERS AFTER CYCLE 5

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.361	0.058	0.439	0.012	-3.103	0.157	2.280	0.062	0.0	0.0	17.2	9.0	0.0457
0002	1.700	0.064	0.439	0.012	-3.877	0.181	2.280	0.062	0.0	0.0	11.0	9.0	0.2748
0003	0.737	0.050	0.439	0.012	-1.681	0.123	2.280	0.062	0.0	0.0	2.6	9.0	0.9779
0004	0.218	0.048	0.439	0.012	-0.497	0.111	2.280	0.062	0.0	0.0	10.1	9.0	0.3461
0005	-0.802	0.052	0.439	0.012	1.829	0.128	2.280	0.062	0.0	0.0	28.9	9.0	0 0007
0006	1.932	0.069	0.439	0.012	-4.404	0.198	2.280	0.062	0.0	0.0	6.9	9.0	.6499
0007	0.474	0.049	0.439	0.012	-1.080	0.115	2.280	0.062	0.0	0.0	16.8	9.0	0.0518
0008	1.097	0.055	0.439	0.012	-2.501	0.142	2.280	0.062	0.0	0.0	1.8	9.0	0.9939
0009	0.706	0.051	0.439	0.012	-1.610	0.123	2.280	0.062	0.0	0.0	5.6	9.0	0.7768
0010	0.232	0.049	0.439	0.012	-0.528	0.112	2.280	0.062	0.0	0.0	5.2	9.0	0.8162
0011	0.576	0.050	0.439	0.012	-1.314	0.120	2.280	0.062	0.0	0.0	22.2	9.0	0.0084
0012	-1.786	0.067	0.439	0.012	4.072	0.188	2.280	0.062	0.0	0.0	21.9	9.0	0.0093
0013	-0.752	0.051	0.439	0.012	1.716	0.124	2.280	0.062	0.0	0.0	4.7	9.0	0.8581
0014	1.164	0.055	0.439	0.012	-2.653	0.145	2.280	0.062	0.0	0.0	19.3	9.0	0.0229
0015	1.862	0.068	0.439	0.012	-4.246	0.194	2.280	0.062	0.0	0.0	9.4	9.0	0.3849
0016	0.322	0.049	0.439	0.012	-0.735	0.114	2.280	0.062	0.0	0.0	14.0	9.0	0.1216
0017	-1.674	0.064	0.439	0.012	3.816	0.179	2.280	0.062	0.0	0.0	15.1	9.0	0.0871
0018	0.190	0.048	0.439	0.012	-0.434	0.111	2.280	0.062	0.0	0.0	9.3	9.0	0.4058
0019	-0.602	0.050	0.439	0.012	1.373	0.120	2.280	0.062	0.0	0.0	18.1	9.0	0.0340
0020	-0.036	0.048	0.439	0.012	0.081	0.110	2.280	0.062	0.0	0.0	18.2	9.0	0.0324
LARGEST CHANGE =	0.004										258.4	180.0	0.0001

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4000D+01	-0.3111D+01	-0.2222D+01	-0.1333D+01	-0.4444D+00	0.4444D+00	0.1333D+01	0.2222D+01	0.3111D+01	0.4000D+01
WEIGHT	0.5671D-04	0.2378D-02	0.3130D-01	0.1470D+00	0.3213D+00	0.3211D+00	0.1425D+00	0.3110D-01	0.3095D-02	0.1209D-03

B I L O G
MAXIMUM LIKELIHOOD ITEM ANALYSIS AND TEST SCORING: LOGISTIC MODEL

DISTRIBUTED BY

INTERNATIONAL EDUCATIONAL SERVICES, INC.
CHICAGO, ILLINOIS

*** LOGISTIC MODEL ITEM ANALYSER ***

CALIBRATION OF GRADE 6 MATH ELEMENT CLASSIFY 2-PARAMETER MODEL 8/82 RJM

LOGISTIC METRIC (I.E., D=1.0)

SUBTEST LENGTHS:
20

SAMPLE SIZE: 1000 OBSERVATIONS

ITEM STATISTICS FOR SUBTEST CLASSIFY

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT	ITEM#TEST CORRELATION PEARSON	BISERIAL
1	0001	1798.0	1409.0	0.784	1.29	0.693	#####
2	0002	1804.0	1508.0	0.836	1.63	0.681	#####
3	0003	1867.0	1248.0	0.668	0.70	0.653	#####
4	0004	1809.0	993.0	0.549	0.20	0.601	#####
5	0005	1786.0	565.0	0.316	-0.77	0.500	#####
6	0006	1838.0	1588.0	0.864	1.85	0.690	#####
7	0007	1837.0	1120.0	0.610	0.45	0.652	#####
8	0008	1805.0	1332.0	0.738	1.04	0.650	#####
9	0009	1822.0	1201.0	0.659	0.66	0.649	#####
10	0010	1787.0	986.0	0.552	0.21	0.649	#####
11	0011	1768.0	1116.0	0.631	0.54	0.635	#####
12	0012	1795.0	271.0	0.151	-1.73	0.401	#####
13	0013	1857.0	605.0	0.326	-0.73	0.513	#####
14	0014	1818.0	1365.0	0.751	1.10	0.669	#####
15	0015	1789.0	1532.0	0.856	1.79	0.693	#####
16	0016	1764.0	1013.0	0.574	0.30	0.620	#####
17	0017	1822.0	302.0	0.166	-1.62	0.405	#####
18	0018	1804.0	980.0	0.543	0.17	0.626	#####
19	0019	1816.0	649.0	0.357	-0.59	0.512	#####
20	0020	1817.0	887.0	0.488	-0.05	0.587	#####

NUMBERS OF FRACTILES OR QUAD POINTS BY SUBTEST:
10

****

CALIBRATION OF SUBTEST

CLASSIFY

****

QUADRATURE POINTS AND PRIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4000D+01	-0.3111D+01	-0.2222D+01	-0.1333D+01	-0.4444D+00	0.4444D+00	0.1333D+01	0.2222D+01	0.3111D+01	0.4000D+01
WEIGHT	0.1190D-03	0.2805D-02	0.3002D-01	0.1458D+00	0.3213D+00	0.3213D+00	0.1458D+00	0.3002D-01	0.2805D-02	0.1190D-03

PRIOR DISTRIBUTIONS ON ITEM PARAMETERS (THRESHOLDS, NORMAL; SLOPES, LOG-NORMAL; GUESSING, BETA)

	THRESHOLDS		SLOPES		ASYMPTOTES	
ITEM	MU	SIGMA	MU	SIGMA	ALPHA	BETA
0001	********	********	-0.821	1.000	********	********
0002	********	********	-0.821	1.000	********	********
0003	********	********	-0.821	1.000	********	********
0004	********	********	-0.821	1.000	********	********
0005	********	********	-0.821	1.000	********	********
0006	********	********	-0.821	1.000	********	********
0007	********	********	-0.821	1.000	********	********
0008	********	********	-0.821	1.000	********	********
0009	********	********	-0.821	1.000	********	********
0010	********	********	-0.821	1.000	********	********
0011	********	********	-0.821	1.000	********	********
0012	********	********	-0.821	1.000	********	********
0013	********	********	-0.821	1.000	********	********
0014	********	********	-0.821	1.000	********	********
0015	********	********	-0.821	1.000	********	********
0016	********	********	-0.821	1.000	********	********
0017	********	********	-0.821	1.000	********	********
0018	********	********	-0.821	1.000	********	********
0019	********	********	-0.821	1.000	********	********
0020	********	********	-0.821	1.000	********	********

-2 LOG LIKELIHOOD = 41904.455
CYCLE 1; LARGEST CHANGE= 0.17823

-2 LOG LIKELIHOOD = 41815.237
CYCLE 2; LARGEST CHANGE= 0.07769

-2 LOG LIKELIHOOD = 41800.841
CYCLE 3; LARGEST CHANGE= 0.03580

-2 LOG LIKELIHOOD = 41798.210
CYCLE 4; LARGEST CHANGE= 0.03173

-2 LOG LIKELIHOOD = 41797.363
CYCLE 5; LARGEST CHANGE= 0.00202

INTERVAL COUNTS OF TRIES AND ATTEMPTS FOR COMPUTATION OF ITEM CHI-SQUARES

AVRGE THETA>>	-2.49	-1.75	-1.30	-0.80	-0.27	0.26	0.78	1.41	1.81	2.68
ITEM 0001										
TRIED	103	125	186	203	272	324	261	162	80	79
RIGHT	40	82	135	157	220	265	222	143	72	70
EXPECTED	57	79	127	148	211	265	222	143	72	74
ITEM 0002										
TRIED	95	131	171	214	274	310	265	151	97	96
RIGHT	58	87	128	174	230	267	247	138	89	90
EXPECTED	58	91	127	169	227	268	237	139	91	92
ITEM 0003										
TRIED	98	134	170	212	289	330	274	157	98	102
RIGHT	46	57	88	116	193	245	199	125	86	90
EXPECTED	38	64	90	125	187	232	206	126	82	90
ITEM 0004										
TRIED	101	124	182	202	274	328	272	151	92	80
RIGHT	25	44	67	87	136	192	182	114	74	69
EXPECTED	24	40	69	90	142	194	179	111	71	68
ITEM 0005										
TRIED	92	128	175	204	277	306	258	148	101	97
RIGHT	9	12	19	34	58	103	116	82	61	71
EXPECTED	5	13	24	38	71	104	112	82	63	74
ITEM 0006										
TRIED	100	133	184	217	285	300	269	146	97	105
RIGHT	65	97	143	178	248	273	248	138	94	102
EXPECTED	63	96	142	178	246	269	248	138	93	102
ITEM 0007										
TRIED	99	131	175	215	277	318	267	150	103	97
RIGHT	25	50	78	114	180	206	181	121	82	78
EXPECTED	31	52	79	111	162	206	189	115	83	84
ITEM 0008										
TRIED	103	121	180	208	282	322	271	145	91	79
RIGHT	54	76	114	146	212	238	219	120	78	72
EXPECTED	54	72	115	142	205	247	217	122	78	71

ITEM 0009										
TRIED	99	133	182	209	275	329	273	145	92	82
RIGHT	45	68	105	126	162	232	201	118	67	74
EXPECTED	43	67	100	125	177	227	199	112	74	70
ITEM 0010										
TRIED	99	129	178	198	276	313	258	161	88	83
RIGHT	23	47	64	87	148	197	165	116	68	68
EXPECTED	25	44	70	90	145	185	169	117	67	69

INTERVAL COUNTS OF TRIES AND ATTEMPTS FOR COMPUTATION OF ITEM CHI-SQUARES

AVRGE THETA>>	-2.49	-1.75	-1.30	-0.80	-0.27	0.26	0.78	1.41	1.81	2.68
ITEM 0011										
TRIED	96	128	188	187	272	321	247	151	89	88
RIGHT	53	65	101	107	181	201	162	115	64	67
EXPECTED	48	69	106	111	169	208	167	107	64	67
ITEM 0012										
TRIED	94	134	176	189	295	318	257	149	87	95
RIGHT	7	8	13	17	22	45	39	45	30	45
EXPECTED	3	7	12	17	35	50	52	41	28	43
ITEM 0013										
TRIED	100	135	181	220	284	317	273	147	95	102
RIGHT	13	21	42	38	77	110	113	66	54	68
EXPECTED	11	21	34	52	82	110	112	73	52	67
ITEM 0014										
TRIED	97	130	180	196	294	333	256	153	91	88
RIGHT	62	91	130	145	216	254	208	118	69	72
EXPECTED	65	90	128	143	219	254	199	122	73	73
ITEM 0015										
TRIED	98	130	177	180	287	325	255	153	92	92
RIGHT	59	97	138	147	245	291	233	145	87	90
EXPECTED	61	93	135	146	245	288	233	143	87	89
ITEM 0016										
TRIED	93	128	172	184	286	327	245	155	82	90
RIGHT	26	42	67	85	159	205	173	113	58	84
EXPECTED	24	45	70	87	156	202	167	116	65	77
ITEM 0017										
TRIED	99	138	171	187	288	336	262	150	95	95
RIGHT	12	18	20	25	37	48	48	31	32	31
EXPECTED	8	14	20	25	44	58	51	34	24	29
ITEM 0018										
TRIED	94	129	183	205	282	315	260	144	95	97
RIGHT	21	39	71	108	152	170	169	98	71	81
EXPECTED	25	44	72	93	145	183	166	102	71	79
ITEM 0019										
TRIED	97	129	182	196	290	338	254	156	85	90
RIGHT	23	41	49	67	93	118	110	66	41	42
EXPECTED	24	35	54	62	100	125	101	67	38	45
ITEM 0020										
TRIED	99	130	183	196	292	330	255	153	90	89
RIGHT	35	47	74	87	138	173	133	82	55	53
EXPECTED	35	51	77	87	139	166	136	87	53	56

SUBTEST CLASSIFY; ITEM PARAMETERS AFTER CYCLE 5

ITEM	INTERCEPT	S.E.	SLOPE	S.E.	THRESHOLD	S.E.	DISPERSN	S.E.	ASYMPTOTE	S.E.	CHISQ	DF	PROB
0001	1.370	0.058	0.471	0.056	-2.911	0.368	2.125	0.253	0.0	0.0	18.7	8.0	0.0166
0002	1.728	0.065	0.522	0.061	-3.308	0.409	1.915	0.225	0.0	0.0	7.8	8.0	0.4500
0003	0.742	0.050	0.481	0.050	-1.541	0.192	2.077	0.218	0.0	0.0	11.0	8.0	0.2035
0004	0.224	0.049	0.553	0.051	-0.405	0.096	1.810	0.167	0.0	0.0	2.7	8.0	0.9535
0005	-0.865	0.054	0.761	0.057	1.137	0.111	1.314	0.098	0.0	0.0	7.9	8.0	0.4391
0006	1.990	0.070	0.589	0.064	-3.378	0.386	1.698	0.185	0.0	0.0	1.4	8.0	0.9928
0007	0.480	0.049	0.511	0.050	-0.939	0.133	1.957	0.191	0.0	0.0	11.8	8.0	0.1597
0008	1.086	0.054	0.394	0.053	-2.754	0.394	2.536	0.340	0.0	0.0	3.4	8.0	0.9079
0009	0.695	0.050	0.384	0.050	-1.813	0.269	2.607	0.337	0.0	0.0	10.7	8.0	0.2182
0010	0.237	0.049	0.520	0.050	-0.455	0.104	1.921	0.186	0.0	0.0	4.2	8.0	0.8428
0011	0.552	0.050	0.229	0.047	-2.410	0.538	4.369	0.892	0.0	0.0	8.4	8.0	0.3999
0012	-1.848	0.068	0.615	0.064	3.004	0.332	1.625	0.170	0.0	0.0	16.1	8.0	0.0407
0013	-0.766	0.051	0.525	0.051	1.460	0.173	1.905	0.187	0.0	0.0	9.2	8.0	0.3264
0014	1.115	0.054	0.169	0.049	-6.603	1.937	5.920	1.713	0.0	0.0	4.6	8.0	0.8013
0015	1.906	0.069	0.559	0.064	-3.410	0.412	1.789	0.206	0.0	0.0	1.7	8.0	0.9868
0016	0.331	0.050	0.547	0.052	-0.604	0.108	1.827	0.173	0.0	0.0	10.2	8.0	0.2480
0017	-1.643	0.063	0.300	0.060	5.471	1.113	3.330	0.665	0.0	0.0	10.6	8.0	0.2231
0018	0.193	0.049	0.487	0.050	-0.396	0.108	2.053	0.211	0.0	0.0	9.8	8.0	0.2771
0019	-0.589	0.049	0.217	0.047	2.709	0.625	4.603	0.989	0.0	0.0	5.4	8.0	0.7157
0020	-0.042	0.047	0.219	0.045	0.190	0.219	4.567	0.935	0.0	0.0	4.0	8.0	0.8616
LARGEST CHANGE =	0.002										159.6	160.0	0.4939

QUADRATURE POINTS AND POSTERIOR WEIGHTS:

	1	2	3	4	5	6	7	8	9	10
POINT	-0.4000D+01	-0.3111D+01	-0.2222D+01	-0.1333D+01	-0.4444D+00	0.4444D+00	0.1333D+01	0.2222D+01	0.3111D+01	0.4000D+01
WEIGHT	0.6480D-04	0.2549D-02	0.3050D-01	0.1447D+00	0.3201D+00	0.3245D+00	0.1433D+00	0.3092D-01	0.3242D-02	0.1111D-03

APPENDIX B

1981-82 CAP GRADE 6 ITEM PARAMETER ESTIMATES

TABLE B- 1

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
JUDGING WRITING

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	9	200	(8)	318	(17)	85	(11)
4	9	199	(11)	370	(33)	124	(23)
8	9	253	(2)	357	(12)	75	(9)
12	9	159	(14)	270	(21)	80	(11)
14	9	-89	(130)	228	(175)	229	(85)
15	9	227	(6)	379	(25)	110	(18)
16	8	194	(6)	259	(9)	47	(4)
17	9	126	(21)	242	(28)	83	(13)
18	8	86	(33)	216	(41)	93	(17)
19	8	108	(22)	175	(24)	49	(7)
20	9	121	(23)	246	(31)	90	(15)
21	8	120	(26)	270	(38)	108	(20)
24	8	105	(29)	247	(39)	102	(19)
27	8	204	(15)	473	(72)	194	(51)
28	9	139	(19)	262	(27)	88	(14)
30	8	166	(12)	264	(17)	71	(9)
32	8	165	(19)	351	(42)	134	(27)
34	8	-77	(139)	368	(230)	321	(132)
35	9	193	(8)	293	(15)	72	(9)
36	9	176	(16)	349	(36)	124	(23)
39	9	215	(7)	362	(24)	106	(17)
40	9	166	(16)	314	(30)	107	(18)

TABLE B- 2

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
TOPIC SENTENCES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	8	351	(22)	542	(49)	138	(32)
7	7	210	(7)	326	(18)	84	(12)
11	7	113	(24)	214	(30)	73	(12)
15	8	171	(7)	212	(8)	30	(2)
19	9	82	(37)	217	(47)	98	(21)
23	7	192	(6)	252	(8)	43	(4)
27	9	197	(9)	322	(21)	90	(14)
31	7	145	(16)	237	(21)	66	(9)
35	8	114	(23)	207	(28)	68	(11)
39	7	62	(52)	260	(75)	143	(38)

TABLE B- 3

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
DETAILS SEQUENCE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	7	169	(9)	212	(10)	31	(3)
5	7	272	(2)	386	(17)	82	(12)
9	9	178	(13)	286	(21)	78	(12)
13	9	81	(51)	289	(79)	150	(43)
17	7	205	(6)	283	(11)	56	(6)
21	7	100	(30)	186	(34)	62	(12)
25	7	109	(27)	196	(32)	63	(11)
29	9	168	(12)	243	(15)	54	(7)
33	7	72	(60)	316	(98)	176	(56)
37	7	123	(23)	200	(26)	55	(9)

TABLE B- 4

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
OUTLINE ORGANIZATION

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	8	149	(15)	236	(19)	63	(8)
6	9	232	(4)	327	(11)	68	(8)
10	7	125	(21)	222	(26)	70	(11)
14	8	128	(24)	267	(35)	100	(18)
18	7	209	(5)	283	(9	53	(5)
22	7	118	(24)	230	(30)	80	(13)
26	7	310	(7)	436	(19)	91	(13)
30	7	177	(11)	277	(17)	72	(9)
34	9	153	(15)	249	(20)	69	(9)
38	9	160	(15)	272	(22)	81	(12)

TABLE B- 5

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
VERB PRONOUN USE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	7	181	(8)	231	(9)	35	(4)
8	7	175	(13)	270	(20)	69	(11)
12	8	152	(15)	217	(18)	47	(7)
16	9	115	(30)	219	(38)	75	(16)
20	7	127	(47)	392	(110)	191	(72)
24	7	149	(30)	337	(61)	135	(39)
28	7	-238	(302)	3	(337)	175	(107)
32	9	155	(17)	247	(23)	67	(11)
36	7	100	(33)	174	(36)	53	(11)
40	8	164	(10)	207	(11)	32	(4)

TABLE B- 6

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SIMPLE SENTENCES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	6	217	(8)	372	(27)	112	(18)
9	6	273	(3)	490	(47)	157	(34)
11	6	246	(5)	534	(80)	208	(57)
12	6	254	(3)	453	(41)	144	(29)
22	6	118	(28)	273	(41)	112	(21)
23	6	334	(30)	899	(242)	407	(173)
27	6	183	(10)	290	(17)	77	(10)
28	6	214	(8)	366	(26)	110	(18)
31	6	255	(2)	356	(12)	73	(8)
34	6	274	(2)	381	(13)	77	(9)
35	6	323	(10)	484	(30)	116	(20)
36	6	275	(2)	376	(11)	73	(8)
38	6	282	(3)	358	(7)	55	(5)

TABLE B- 7

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
COMPOUND SENTENCES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	6	227	(4)	328	(13)	73	(9)
5	6	211	(6)	312	(14)	73	(9)
7	6	57	(44)	161	(50)	75	(16)
8	6	94	(33)	225	(42)	95	(19)
14	6	224	(5)	324	(13)	72	(9)
17	6	276	(3)	386	(14)	79	(10)
20	6	251	(2)	395	(24)	105	(17)
21	6	129	(24)	263	(34)	97	(17)
25	6	170	(13)	273	(19)	74	(10)
29	6	229	(5)	346	(16)	84	(11)
32	6	201	(8)	312	(17)	80	(11)
33	6	195	(9)	303	(17)	78	(10)
39	6	210	(8)	340	(21)	94	(14)

TABLE B- 8

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
COMPLEX SENTENCES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	6	215	(6)	330	(15)	62	(10)
4	6	142	(16)	254	(22)	81	(11)
6	6	166	(13)	289	(21)	89	(12)
10	6	193	(6)	265	(9)	52	(4)
13	6	173	(11)	289	(19)	84	(11)
15	6	205	(9)	367	(28)	117	(19)
16	6	192	(7)	286	(12)	68	(7)
18	6	233	(4)	346	(13)	81	(9)
19	6	203	(7)	311	(14)	78	(9)
24	6	159	(13)	275	(20)	84	(11)
26	6	116	(22)	239	(29)	89	(14)
30	6	207	(6)	297	(10)	65	(6)
37	6	142	(18)	280	(28)	100	(16)
40	6	222	(5)	344	(16)	88	(11)

TABLE B- 9

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
CONJUNCTIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	7	87	(34)	144	(35)	41	(8)
7	8	209	(5)	277	(8)	49	(4)
11	9	134	(18)	219	(22)	62	(9)
15	7	-48	(102)	92	(112)	102	(34)
19	7	137	(15)	198	(17)	44	(5)
23	9	188	(7)	251	(9)	46	(4)
27	7	210	(5)	288	(10)	57	(6)
31	8	44	(50)	152	(56)	78	(18)
35	7	142	(17)	229	(21)	63	(9)
39	8	-109	(141)	184	(180)	.212	(81)

TABLE B- 10

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SUPPLYING SUBJECTS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	5	149	(15)	214	(17)	47	(7)
5	5	172	(9)	221	(10)	35	(4)
8	5	163	(11)	224	(14)	44	(6)
11	5	125	(22)	172	(23)	34	(6)
14	5	158	(15)	247	(20)	64	(10)
17	5	130	(20)	177	(21)	34	(5)
20	5	112	(26)	179	(29)	49	(9)
23	5	38	(62)	142	(69)	75	(22)
26	5	122	(22)	186	(25)	46	(8)
29	5	102	(34)	148	(36)	33	(7)
32	5	112	(29)	217	(36)	76	(16)
35	5	160	(11)	207	(12)	34	(4)
38	5	32	(66)	141	(74)	79	(24)

TABLE B- 11

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SUPPLYING PREDICATES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	5	113	(24)	205	(29)	66	(11)
6	5	56	(48)	179	(56)	88	(21)
9	5	114	(28)	242	(38)	93	(18)
12	5	107	(26)	182	(29)	54	(9)
15	5	138	(17)	213	(20)	54	(8)
18	5	88	(34)	198	(41)	80	(16)
21	5	122	(22)	214	(26)	66	(11)
24	5	180	(8)	245	(11)	47	(5)
27	5	188	(8)	265	(12)	56	(6)
30	5	127	(20)	213	(24)	61	(9)
33	5	207	(5)	278	(9)	52	(5)
36	5	135	(19)	232	(24)	70	(11)
39	5	102	(27)	161	(29)	43	(7)

TABLE B- 12

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
FORMING SENTENCES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	5	308	(7)	450	(23)	102	(16)
4	5	257	(2)	419	(28)	117	(20)
7	5	303	(9)	523	(51)	159	(36)
10	5	251	(2)	365	(14)	82	(10)
13	5	230	(8)	439	(46)	151	(33)
16	5	210	(7)	323	(16)	81	(11)
19	5	258	(2)	359	(12)	73	(8)
22	5	275	(3)	502	(52)	164	(37)
25	5	272	(2)	402	(19)	94	(13)
28	5	89	(31)	191	(36)	74	(13)
31	5	289	(5)	450	(28)	116	(20)
34	5	29	(56)	171	(65)	103	(24)
37	5	287	(3)	371	(9)	60	(6)
40		386	(23)	546	(38)	115	(22)

TABLE B- 13

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SENSORY WORDS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	9	-29	(127)	322	(201)	254	(112)
5	9	171	(13)	266	(19)	68	(10)
9	9	117	(32)	261	(46)	104	(24)
13	7	205	(5)	256	(7)	37	(3)
17	8	142	(22)	258	(31)	83	(16)
21	9	119	(35)	292	(56)	125	(32)
25	9	137	(19)	220	(24)	60	(10)
29	7	213	(10)	303	(40)	123	(28)
33	9	174	(13)	272	(20)	71	(11)
37	9	69	(47)	197	(57)	92	(23)

TABLE B- 14

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SPECIFIC WORDS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	7	121	(24)	264	(34)	103	(18)
6	7	270	(2)	376	(12)	76	(9)
10	9	214	(5)	297	(9)	59	(6)
14	7	187	(10)	309	(19)	88	(12)
18	9	181	(10)	291	(17)	79	(10)
22	9	148	(13)	235	(17)	63	(7)
26	8	174	(15)	335	(31)	116	(20)
30	9	146	(14)	229	(17)	60	(7)
34	7	232	(3)	302	(7)	51	(4)
38	7	243	(2)	336	(10)	68	(7)

TABLE B- 15

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
ACHIEVING TONE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	8	131	(20)	238	(26)	77	(12)
7	9	138	(17)	227	(21)	64	(9)
16	7	163	(12)	248	(16)	62	(8)
24	9	196	(6)	264	(9)	49	(4)
25	8	113	(22)	192	(25)	57	(8)
28	8	159	(10)	218	(12)	42	(4)
32	7	203	(5)	268	(8)	47	(4)
33	8	122	(24)	255	(34)	96	(17)
36	8	154	(12)	227	(15)	53	(6)
37	8	-1	(71)	157	(83)	115	(31)

TABLE B- 16

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
IRREGULAR VERBS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	2	216	(5)	290	(8)	53	(5)
6	2	145	(17)	252	(23)	77	(11)
10	2	225	(5)	327	(13)	74	(9)
14	2	131	(18)	212	(21)	58	(8)
18	2	70	(39)	200	(48)	94	(19)
22	2	175	(8)	234	(10)	43	(4)
26	2	64	(2)	202	(51)	100	(21)
30	2	197	(7)	280	(11)	60	(6)
34	2	143	(16)	234	(19)	63	(8)
38	2	177	(10)	265	(15)	64	(8)

TABLE B- 17

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
PRONOUNS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	2	-82	(143)	274	(205)	257	(106)
7	2	-47	(108)	171	(133)	158	(55)
11	2	-427	(366)	90	(457)	373	(198)
15	2	159	(11)	203	(12)	32	(3)
19	2	326	(7)	400	(10)	54	(6)
23	2	405	(59)	827	(185)	304	(126)
27	2	296	(3)	362	(7)	48	(4)
31	2	348	(19)	534	(46)	134	(30)
35	2	-459	(475)	-226	(499)	168	(110)
39	2	-90	(132)	91	(148)	132	(49)

TABLE B- 18

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SUBJECT-VERB AGREEMENT

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	2	232	(3)	317	(9)	61	(6)
5	2	142	(20)	268	(29)	91	(15)
9	2	242	(3)	334	(11)	67	(7)
13	2	489	(86)	867	(166)	273	(103)
17	2	111	(29)	254	(40)	103	(20)
21	2	145	(12)	193	(13)	35	(3)
25	2	41	(52)	133	(56)	66	(16)
29	2	191	(7)	263	(10)	52	(5)
33	2	188	(8)	265	(11)	55	(6)
37	2	130	(17)	197	(19)	48	(6)

TABLE B- 19

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
NOUN DETERMINERS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	2	62	(44)	140	(48)	56	(13)
8	2	56	(46)	154	(51)	71	(16)
12	2	159	(9)	203	(10)	31	(3)
16	2	114	(23)	187	(25)	53	(8)
20	2	127	(18)	183	(19)	41	(6)
24	2	152	(11)	202	(12)	36	(4)
28	2	132	(16)	187	(17)	39	(5)
32	2	80	(35)	160	(38)	58	(11)
36	2	126	(19)	200	(22)	54	(8)
40	2	186	(6)	240	(8)	39	(3)

TABLE B- 20

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
DOUBLE NEGATIVES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	3	218	(5)	304	(10)	62	(6)
7	3	180	(7)	239	(9)	42	(4)
11	3	11	(66)	105	(70)	68	(18)
15	3	186	(6)	241	(8)	40	(3)
19	3	125	(17)	188	(18)	46	(6)
23	3	130	(16)	203	(18)	52	(6)
27	3	125	(17)	189	(19)	46	(6)
31	3	163	(10)	232	(12)	50	(5)
35	3	146	(12)	208	(14)	45	(5)
39	3	209	(6)	304	(12)	69	(8)

TABLE B- 21

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT SUFFIXES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	3	101	(29)	161	(31)	43	(8)
8	3	163	(9)	201	(10)	28	(3)
12	3	126	(19)	182	(21)	40	(6)
16	3	163	(16)	279	(25)	83	(14)
20	3	-19	(96)	90	(103)	79	(28)
24	3	220	(4)	283	(7)	45	(4)
28	3	122	(28)	270	(43)	107	(23)
32	3	124	(19)	186	(21)	44	(6)
36	3	503	(105)	882	(192)	272	(116)
40	3	181	(7)	238	(9)	41	(4)

TABLE B- 22

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT IRREGULAR NOUN PLURALS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	3	123	(20)	243	(26)	86	(12)
5	3	173	(9)	252	(11)	57	(5)
9	3	195	(6)	270	(9)	54	(5)
13	3	148	(11)	206	(12)	42	(4)
17	3	193	(8)	285	(12)	67	(7)
21	3	237	(3)	303	(6)	50	(4)
25	3	295	(3)	384	(9)	64	(6)
29	3	166	(10)	244	(12)	56	(5)
33	3	220	(5)	319	(11)	71	(7)
37	3	28	(53)	210	(66)	132	(29)

TABLE B- 23

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
CONTRACTIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	4	158	(15)	263	(23)	76	(12)
5	4	333	(15)	477	(31)	104	(20)
9	4	-24	(96)	194	(122)	158	(54)
13	4	186	(10)	293	(19)	78	(12)
16	4	215	(7)	346	(24)	95	(16)
18	4	124	(24)	241	(33)	84	(16)
20	4	205	(9)	338	(24)	95	(16)
27	4	46	(57)	218	(74)	124	(34)
29	4	187	(10)	292	(18)	76	(11)
34	4	78	(37)	167	(42)	64	(14)
35	4	167	(11)	240	(14)	53	(7)
38	4	139	(18)	228	(23)	64	(10)

TABLE B- 24

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SPELLING PREDICTABLE WORDS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	1	127	(21)	241	(28)	83	(13)
3	1	203	(9)	347	(25)	104	(17)
5	1	113	(26)	239	(34)	91	(16)
9	1	41	(50)	131	(55)	65	(15)
11	1	-297	(267)	-24	(298)	196	(94)
13	1	115	(23)	215	(28)	72	(12)
17	1	178	(13)	310	(24)	96	(15)
19	1	49	(45)	147	(50)	71	(15)
21	1	257	(2)	355	(11)	71	(8)
25	1	218	(5)	320	(13)	73	(9)
27	1	108	(28)	243	(37)	97	(18)
29	1	229	(5)	380	(25)	109	(18)
33	1	196	(8)	301	(15)	76	(10)
35	1	207	(6)	291	(11)	61	(6)
39	1	240	(3)	366	(18)	91	(13)

TABLE B- 25

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SPELLING WORDS WITH SUFFIXES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	1	163	(12)	244	(16)	58	(7)
6	1	159	(22)	334	(44)	126	(28)
7	1	166	(37)	565	(164)	288	(116)
10	1	144	(15)	219	(18)	54	(7)
14	1	393	(33)	583	(57)	137	(33)
15	1	240	(4)	402	(31)	117	(23)
18	1	218	(5)	323	(15)	76	(10)
22	1	175	(19)	361	(46)	134	(30)
23	1	155	(16)	263	(23)	78	(12)
26	1	127	(38)	369	(79)	175	(50)
30	1	177	(13)	298	(23)	87	(14)
31	1	123	(24)	236	(31)	81	(14)
34	1	157	(20)	311	(37)	111	(22)
37	1	310	(12)	499	(44)	136	(31)
38	1	227	(4)	308	(10)	59	(6)

TABLE B- 26

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SPELLING DEMONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	1	261	(2)	341	(8)	57	(6)
8	1	125	(20)	220	(25)	69	(11)
12	1	191	(7)	279	(13)	63	(7)
16	1	116	(27)	250	(37)	97	(19)
20	1	87	(30)	175	(34)	63	(12)
24	1	102	(27)	207	(33)	76	(13)
28	1	136	(20)	265	(30)	93	(16)
32	1	178	(22)	445	(81)	193	(56)
36	1	136	(15)	208	(18)	52	(7)
40	1	152	(14)	241	(18)	64	(9)

TABLE B- 27

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
SPELLING HOMOPHONES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	3	-20	(108)	261	(155)	204	(80)
6	3	145	(22)	279	(35)	96	(20)
10	3	69	(55)	262	(79)	139	(41)
14	3	60	(50)	185	(60)	90	(23)
18	3	168	(12)	251	(17)	59	(8)
22	3	104	(29)	194	(34)	63	(13)
26	3	188	(21)	449	(86)	188	(60)
30	3	178	(10)	256	(14)	57	(7)
34	3	256	(1)	323	(7)	48	(5)
38	3	208	(12)	407	(53)	143	(37)

TABLE B- 28

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
CAPITALIZATION

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	4	172	(9)	228	(10)	40	(4)
6	4	-185	(241)	-36	(255)	107	(58)
10	4	218	(4)	288	(8)	51	(5)
12	4	266	(2)	407	(24)	102	(17)
15	4	338	(14)	466	(26)	92	(16)
19	4	55	(48)	172	(55)	84	(20)
22	4	339	(11)	427	(15)	63	(9)
23	4	-136	(212)	-15	(222)	87	(47)
25	4	-129	(157)	93	(182)	160	(65)
26	4	32	(64)	115	(68)	60	(17)
31	4	3	(74)	146	(85)	103	(30)
32	4	251	(2)	482	(60)	167	(44)
36	4	190	(8)	271	(12)	58	(7)
40	4	277	(5)	470	(44)	140	(32)

TABLE B- 29

ITEM PARAMETERS FOR GRADE 6 WRITTEN LANGUAGE ELEMENT
PUNCTUATION

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	4	195	(7)	278	(11)	60	(6)
4	4	190	(9)	302	(17)	81	(11)
7	4	87	(39)	276	(58)	136	(31)
8	4	280	(5)	476	(40)	142	(29)
11	4	172	(8)	233	(10)	44	(4)
14	4	116	(19)	181	(21)	47	(6)
17	4	75	(35)	196	(43)	88	(17)
21	4	111	(21)	182	(23)	52	(7)
24	4	184	(11)	316	(23)	96	(14)
28	4	283	(6)	480	(40)	142	(29)
30	4	110	(35)	325	(63)	155	(37)
33	4	193	(6)	254	(8)	45	(4)
37	4	158	(13)	256	(18)	71	(9)
39	4	233	(3)	329	(11)	69	(8)

TABLE B- 30

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
COUNTING AND NUMERATION

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
6	20	178	(13)	324	(25)	105	(15)
22	10	133	(24)	309	(40)	127	(23)
23	22	245	(3)	325	(7)	57	(5)
24	11	350	(8)	421	(10)	52	(4)
26	21	237	(3)	311	(7)	53	(4)
27	11	217	(4)	279	(6)	45	(3)
28	13	-22	(77)	199	(9)	160	(43)
29	22	237	(3)	329	(9)	67	(6)
30	10	193	(9)	313	(17)	87	(11)
31	20	26	(51)	165	(59)	100	(21)
33	11	41	(44)	172	(51)	94	(19)
34	22	173	(12)	297	(20)	89	(12)
35	11	142	(19)	281	(28)	100	(15)
37	10	93	(26)	193	(30)	72	(11)
38	10	246	(3)	327	(7)	58	(5)

TABLE B- 31

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
PLACE VALUE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	20	170	(12)	279	(19)	79	(10)
7	14	249	(3)	361	(14)	81	(10)
1[illegible]	10	172	(13)	299	(23)	92	(13)
14	12	187	(9)	291	([illegible])	75	(9)
16	22	164	(12)	253	(15)	64	(7)
18	24	[illegible]85	(11)	304	[illegible])	86	(11)
19	13	275	(2)	353	(7)	56	(5)
21	22	1[illegible]2	(23)	255	(32)	96	(16)
25	23	250	(2)	328	(7)	56	(5)
32	10	234	(4)	351	(15)	84	(10)

TABLE B- 32

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
COUNTING & PLACE VALUE APPLICATIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	15	171	(11)	277	(17)	76	(9)
2	12	301	(5)	448	(20)	106	([illegible])
4	21	250	(3)	358	([illegible]2)	78	([illegible])
5	13	200	(9)	339	(21)	100	(14)
8	22	275	(2)	404	(16)	94	(11)
9	22	187	(14)	365	(33)	129	(22)
10	12	208	(6)	303	(11)	68	(7)
12	31	213	(6)	303	(10)	65	(6)
13	13	242	(3)	320	(7)	57	(5)
15	22	226	(4)	317	(10)	66	(6)
17	25	198	(9)	323	(18)	90	(11)
20	12	204	(7)	304	(12)	72	(7)
36	22	194	(7)	284	(11)	65	(6)
39	[illegible]1	142	(18)	275	(26)	96	(14)
40	22	186	(10)	30	(17)	85	(10)

TABLE B- 33

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
ORDERING & PROPERTIES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	13	204	(9)	320	(20)	84	(13)
3	21	252	(2)	370	(18)	85	(13)
5	11	242	(3)	332	(11)	65	(8)
12	20	232	(5)	357	(21)	90	(14)
13	14	48	(73)	317	(116)	194	(66)
16	23	142	(22)	258	(30)	83	(15)
17	24	296	(4)	393	(13)	71	(9)
18	23	198	(19)	446	(73)	179	(51)
19	10	210	(7)	306	(14)	69	(9)
20	10	171	(16)	298	(27)	91	(16)
22	12	142	(25)	288	(39)	105	(21)
23	23	124	(30)	279	(46)	112	(24)
29	21	26	(79)	286	(118)	38	(63)
30	11	59	(49)	165	(56)	77	(19)
31	24	172	(13)	267	(19)	68	(10)

TABLE B- 34

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
CLASSIFICATION OF NUMBERS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	11	170	(8)	225	(9)	40	(3)
3	22	114	(20)	206	(24)	66	(9)
4	22	318	(6)	418	(12)	73	(8)
7	11	217	(5)	305	(10)	63	(6)
8	23	184	(11)	308	(20)	90	(12)
16	21	166	(16)	322	(30)	113	(18)
17	23	249	(2)	341	(9)	66	(6)
18	22	157	16)	300	(27)	103	(16)
22	14	97	(30)	247	(40)	108	(19)
23	24	250	(2)	343	(9)	67	(6)
26	22	207	(8)	342	(20)	97	(13)
27	12	210	(13)	495	(74)	205	(52)
29	23	390	(34)	683	(86)	211	(57)
31	22	234	(3)	322	(9)	64	(6)
32	11	406	(19)	503	(23)	70	(9)
33	13	586	(98)	829	(122)	175	(53)
34	21	102	(25)	213	(30)	80	(12)
35	12	-29	(104)	351	(170)	275	(97)
38	11	233	(6)	440	(41)	130	(29)
39	23	321	(6)	411	(11)	66	(6)

TABLE B- 35

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
NATURE OF NUMBERS AND PROPERTIES APPLICATIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
6	23	116	(36)	329	(63)	154	(37)
9	23	248	(3)	348	(12)	72	(8)
10	13	216	(6)	328	(15)	81	(10)
11	12	254	(2)	374	(16)	87	(11)
14	14	237	(4)	342	(13)	76	(9)
15	24	143	(57)	830	(326)	405	(232)
21	23	39	(52)	164	(59)	91	(21)
24	13	186	(11)	298	(19)	61	(11)
25	22	68	(45)	234	(59)	120	(27)
27	13	200	(7)	290	(12)	65	(7)
28	12	257	(2)	361	(12)	75	(9)
33	12	279	(2)	381	(12)	74	(8)
36	23	273	(2)	387	(14)	82	(10)
37	13	280	(3)	436	(26)	112	(19)
40	23	110	(24)	204	(28)	67	(11)

TABLE B- 36

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
ADDING AND SUBTRACTING WHOLE NUMBERS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	10	-152	(169)	101	(199)	183	(75)
4	20	-97	(135)	103	(155)	145	(55)
5	10	-82	(125)	100	(142)	132	(48)
7	10	72	(39)	160	(44)	63	(13)
8	20	197	(7)	274	(11)	55	(6)
13	10	86	(34)	190	(40)	75	(15)
16	20	119	(21)	188	(24)	50	(8)
26	20	288	(7)	478	(41)	137	(30)
27	10	143	(17)	241	(22)	71	(10)
28	10	179	(9)	255	(12)	55	(6)
32	13	250	(2)	350	(12)	72	(9)
34	20	173	(10)	257	(15)	61	(7)
35	10	67	(43)	192	(51)	90	(20)
38	13	220	(7)	359	(24)	100	(17)
39	20	124	(21)	214	(26)	65	(10)

TABLE B- 37

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
MULTIPLYING WHOLE NUMBERS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	10	109	(27)	214	(33)	76	(14)
3	25	267	(2)	376	(15)	79	(11)
12	21	114	(29)	249	(40)	98	(20)
13	12	243	(3)	424	(39)	131	(28)
17	22	161	(20)	323	(39)	117	(25)
18	20	157	(11)	221	(13)	46	(5)
19	11	44	(52)	163	(60)	84	(21)
20	11	136	(21)	257	(30)	87	(15)
22	11	153	(14)	234	(17)	59	(8)
23	20	160	(10)	217	(12)	41	(4)
29	20	140	(19)	249	(26)	78	(13)
30	13	172	(11)	263	(16)	66	(9)
31	23	-210	(221)	20	(247)	167	(79)
37	12	87	(33)	164	(36)	56	(11)

TABLE B- 38

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
DIVIDING WHOLE NUMBERS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
6	24	230	(4)	337	(13)	78	(9)
7	12	303	(10)	540	(54)	171	(39)
9	20	144	(22)	320	(40)	128	(24)
10	10	200	(7)	291	(11)	66	(7)
11	11	151	(17)	291	(28)	101	(16)
14	10	33	(50)	178	(59)	105	(23)
15	20	157	(10)	215	(11)	42	(4)
21	20	165	(15)	312	(27)	106	(16)
24	12	215	(5)	298	(9)	60	(6)
25	21	178	(8)	253	(11)	54	(5)
27	18	69	(36)	198	(43)	93	(17)
33	14	121	(20)	225	(25)	76	(11)
36	20	202	(9)	346	(23)	103	(15)
37	11	181	(10)	289	(16)	77	(9)
40	20	175	(10)	268	(14)	67	(7)

TABLE B- 39

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
ADDING AND SUBTRACTING DECIMALS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	12	31	(46)	139	(50)	78	(15)
3	23	265	(2)	342	(6)	56	(4)
12	22	53	(46)	250	(62)	142	(30)
13	11	203	(6)	292	(10)	64	(6)
17	20	201	(8)	326	(17)	90	(11)
18	21	214	(6)	317	(12)	74	(7)
19	14	91	(27)	213	(33)	88	(14)
20	13	307	(4)	388	(8)	58	(5)
22	13	218	(7)	355	(19)	99	(13)
23	21	268	(2)	352	(7)	61	(5)
29	27	328	(11)	523	(35)	141	(24)
30	12	253	(2)	338	(8)	62	(5)
31	21	224	(5)	324	(11)	72	(7)
37	14	346	(11)	461	(20)	97	(13)

TABLE B- 40

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
MULTIPLYING AND DIVIDING DECIMALS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	13	324	(5)	392	(7)	49	(4)
4	23	265	(2)	368	(10)	74	(7)
5	12	274	(2)	361	(8)	62	(5)
7	13	180	(9)	278	(14)	71	(7)
8	21	287	(3)	357	(6)	50	(4)
16	24	193	(12)	371	(32)	128	(21)
26	23	225	(5)	352	(16)	91	(11)
28	11	158	(13)	269	(19)	80	(10)
32	12	228	(5)	345	(14)	84	(9)
35	13	230	(11)	616	(118)	278	(85)
38	12	290	(3)	397	(12)	77	(8)
39	22	122	(27)	316	(46)	140	(27)

TABLE B- 41

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
OPERATIONS ON FRACTIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
6	21	268	(3)	328	(5)	43	(3)
9	21	220	(4)	292	(7)	51	(4)
10	11	156	(16)	320	(29)	118	(17)
11	13	255	(3)	373	(12)	85	(9)
14	11	287	(3)	389	(10)	74	(7)
15	23	174	(9)	278	(14)	75	(7)
17	21	280	(3)	362	(7)	59	(5)
19	12	248	(3)	355	(10)	77	(7)
21	26	287	(4)	431	(18)	104	(12)
24	10	286	(3)	396	(11)	80	(8)
25	24	232	(4)	348	(12)	83	(8)
27	14	275	(3)	464	(28)	136	(20)
33	10	216	(5)	326	(12)	80	(8)
34	23	284	(3)	368	(7)	61	(5)
36	24	280	(3)	370	(8)	66	(5)
40	21	97	(23)	228	(29)	74	(13)

TABLE B- 42

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
PERCENTS AND EQUIVALENT FRACTIONS/DECIMALS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	11	208	(5)	293	(10)	61	(6)
6	22	252	(2)	402	(23)	108	(16)
10	15	120	(19)	211	(23)	66	(9)
11	14	253	(2)	369	(14)	84	(10)
12	23	268	(2)	364	(10)	69	(7)
14	13	233	(5)	409	(31)	127	(22)
15	21	153	(13)	246	(17)	67	(8)
21	21	19	(54)	149	(61)	94	(21)
24	14	254	(2)	377	(15)	89	(11)
25	20	177	(8)	247	(10)	51	(5)
36	21	207	(7)	329	(17)	88	(11)
40	24	286	(3)	373	(9)	63	(6)

TABLE B- 43

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
APPLICATIONS: ONE-STEP WITH WHOLE NUMBERS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	14	114	(29)	260	(40)	105	(21)
9	31	117	(23)	215	(28)	71	(11)
11	15	175	(10)	258	(14)	60	(7)
18	25	146	(17)	255	(24)	79	(12)
20	14	224	(4)	296	(8)	52	(5)
24	18	142	(16)	226	(20)	61	(8)
28	14	108	(57)	491	(154)	276	(103)
29	24	198	(15)	421	(56)	160	(39)
34	24	254	(2)	363	(14)	78	(10)
36	25	214	(6)	308	(12)	67	(8)
37	16	294	(8)	487	(42)	139	(30)
39	24	190	(8)	273	(12)	60	(7)

TABLE B- 44

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
APPLICATIONS: ONE-STEP WITH RATIONAL NUMBERS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	16	171	(11)	278	(17)	78	(9)
5	15	126	(27)	309	(43)	132	(25)
6	25	276	(2)	425	(21)	107	(15)
9	24	332	(8)	443	(15)	80	(9)
12	25	224	(5)	323	(11)	72	(7)
3	15	404	(23)	557	(34)	110	(18)
14	15	198	(9)	318	(17)	86	(11)
18	26	257	(3)	526	(63)	194	(46)
19	15	280	(3)	407	(16)	91	(11)
20	15	202	(8)	315	(15)	82	(10)
22	15	279	(2)	400	(14)	87	(10)
26	24	258	(2)	375	(13)	84	(10)
27	15	246	(3)	387	(19)	101	(14)
28	15	354	(21)	620	(66)	192	(45)
30	14	242	(3)	336	(9)	67	(6)
31	25	258	(2)	359	(10)	73	(7)
32	14	269	(2)	392	(15)	89	(11)
34	28	185	(14)	361	(33)	127	(21)
38	14	268	(2)	370	(11)	74	(8)
39	25	70	(39)	232	(50)	117	(23)

TABLE B- 45

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
APPLICATIONS: TWO OR MORE STEPS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	16	318	(11)	522	(44)	147	(31)
3	24	193	(11)	334	(25)	102	(16)
4	24	246	(3)	364	(15)	85	(11)
7	16	274	(2)	398	(17)	90	(12)
8	25	183	(13)	329	(27)	105	(17)
10	17	407	(25)	548	(35)	102	(18)
15	25	154	(20)	307	(34)	110	(20)
16	25	341	(12)	476	(24)	97	(13)
17	28	281	(2)	366	(9)	61	(6)
21	24	365	(14)	480	(21)	82	(11)
23	25	235	(4)	333	(11)	70	(8)
25	25	240	(3)	332	(10)	67	(7)
33	15	291	(7)	544	(63)	182	(45)
35	15	250	(3)	403	(25)	114	(18)
40	25	226	(5)	335	(14)	78	(10)

TABLE B- 46

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
EXPRESSIONS AND EQUATIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
6	27	115	(24)	233	(30)	86	(13)
9	25	70	(52)	331	(87)	189	(50)
10	18	184	(8)	263	(11)	57	(5)
11	16	161	(14)	271	(20)	79	(10)
14	16	166	(12)	264	(17)	71	(8)
15	26	181	(10)	283	(16)	74	(9)
21	25	214	(7)	335	(16)	87	(11)
24	17	128	(20)	238	(25)	79	(11)
25	26	313	(7)	460	(23)	106	(16)
26	25	292	(4)	436	(21)	104	(15)
27	16	264	(2)	353	(9)	64	(6)
33	16	218	(7)	350	(19)	95	(13)
34	26	219	(9)	415	(39)	142	(27)
36	27	185	(11)	309	(20)	90	(12)
40	26	238	(3)	334	(10)	70	(7)

TABLE B- 47

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
GRAPHS AND FUNCTION TABLES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	14	278	(2)	357	(7)	57	(5)
3	26	231	(4)	369	(20)	100	(14)
12	26	244	(3)	376	(18)	95	(13)
13	16	201	(7)	312	(15)	80	(10)
17	27	260	(2)	358	(10)	7	(7)
18	27	270	(2)	397	(16)	42	(12)
19	16	197	(10)	359	(29)	117	(19)
20	16	116	(22)	233	(28)	84	(13)
22	16	239	(4)	400	(26)	116	(18)
23	26	234	(3)	334	(11)	72	(8)
29	25	202	(10)	366	(29)	118	(20)
30	15	183	(12)	332	(26)	108	(17)

TABLE B- 48

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
EXPRESSIONS, EQUATIONS AND GRAPHING APPLICATIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	17	281	(3)	381	(12)	73	(8)
4	26	134	(28)	314	(48)	130	(28)
5	14	157	(26)	377	(60)	159	(39)
7	15	137	(18)	226	(22)	64	(9)
8	26	156	(32)	450	(95)	212	(64)
16	26	359	(26)	608	(73)	180	(49)
26	26	207	(6)	296	(12)	64	(7)
28	16	190	(11)	322	(24)	95	(15)
31	26	162	(16)	285	(25)	89	(14)
32	15	140	(20)	261	(28)	87	(14)
35	16	208	(11)	391	(39)	132	(27)
36	28	183	(9)	262	(12)	57	(6)
37	15	191	(10)	303	(18)	81	(11)
38	15	172	(15)	309	(28)	99	(17)
39	28	225	(5)	329	(14)	75	(9)

TABLE B- 49

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
SHAPES AND TERMINOLOGY

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	17	168	(11)	275	(17)	77	(9)
2	15	252	(2)	385	(18)	96	(13)
4	25	171	(11)	276	(16)	75	(9)
5	16	243	(3)	368	(16)	90	(11)
8	24	15	(54)	141	(61)	91	(20)
9	26	225	(4)	303	(8)	57	(5)
10	16	249	(2)	382	(17)	95	(13)
12	24	224	(4)	314	(10)	65	(6)
13	17	178	(8)	258	(11)	58	(6)
15	27	199	(9)	352	(25)	110	(17)
20	17	273	(3)	417	(20)	103	(15)
36	29	120	(19)	230	(25)	79	(11)

TABLE B- 50

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
GEOMETRIC RELATIONSHIPS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	27	211	(6)	324	(15)	81	(10)
7	17	126	(28)	323	(51)	142	(31)
11	17	158	(20)	337	(40)	129	(25)
14	17	307	(5)	375	(7)	49	(4)
16	27	232	(3)	326	(11)	63	(7)
17	17	304	(9)	487	(35)	131	(24)
17	26	310	(7)	423	(16)	82	(10)
18	28	154	(21)	344	(44)	137	(28)
21	27	268	(2)	356	(9)	64	(6)
32	16	107	(25)	225	(31)	85	(14)
39	29	47	(43)	152	(48)	75	(15)
40	27	160	(12)	260	(17)	72	(9)

TABLE B- 51

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
GEOMETRY APPLICATIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
6	29	257	(2)	414	(26)	114	(19)
22	17	41	(48)	126	(51)	61	(13)
23	27	230	(3)	296	(6)	48	(4)
24	16	428	(65)	866	(180)	316	(121)
25	27	134	(19)	244	(25)	79	(12)
26	27	183	(8)	259	(11)	55	(5)
27	17	305	(7)	445	(22)	101	(15)
28	18	156	(16)	288	(26)	95	(15)
29	26	249	(2)	371	(16)	88	(12)
[illegible]	16	158	(16)	292	(26)	96	(15)
31	27	278	(4)	447	(30)	122	(22)
33	17	-153	(159)	63	(180)	157	(60)
34	27	70	(36)	182	(41)	81	(15)
35	18	293	(4)	381	(10)	64	(7)
37	17	230	(4)	345	(15)	83	(11)
38	16	196	(9)	324	(21)	93	(14)

TABLE B- 52

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
METRIC UNITS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	28	117	(22)	247	(29)	94	(14)
6	28	198	(8)	302	(13)	75	(8)
7	20	180	(11)	298	(18)	85	(10)
11	18	222	(11)	510	(70)	208	(50)
14	18	254	(3)	346	(9)	66	(6)
16	28	117	(21)	224	(25)	77	(10)
17	31	265	(2)	347	(7)	59	(5)
18	29	190	(7)	256	(8)	47	(4)
19	19	208	(7)	318	(14)	79	(9)
21	28	665	(126)	934	(152)	194	(62)
22	18	104	(28)	258	(38)	111	(19)
23	28	216	(5)	313	(11)	69	(7)
24	15	237	(5)	395	(23)	114	(16)
25	28	274	(2)	369	(9)	69	(6)
26	28	248	(3)	399	(21)	109	(15)
28	19	346	(12)	505	(26)	115	(17)
30	17	132	(19)	256	(26)	89	(12)
32	18	129	(21)	270	(30)	102	(15)
39	26	264	(2)	487	(43)	161	(31)
40	28	294	(4)	423	(16)	93	(11)

TABLE B- 53

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
U.S. CUSTOMARY UNITS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
5	17	141	(16)	201	(18)	43	(6)
27	19	120	(27)	236	(34)	84	(16)
29	28	171	(13)	267	(19)	69	(10)
30	20	184	(8)	238	(9)	39	(4)
31	28	2	(77)	149	(88)	106	(31)
33	18	300	(5)	417	(17)	81	(11)
34	25	237	(4)	357	(18)	87	(13)
35	19	142	(20)	242	(25)	72	(12)
37	18	177	(13)	287	(21)	79	(12)
38	17	149	(17)	239	(22)	65	(10)

TABLE B- 54

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
LENGTH, AREA, AND VOLUME

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	18	263	(2)	333	(6)	50	(4)
2	18	-476	(348)	56	(429)	384	(180)
4	27	304	(4)	394	(9)	65	(6)
5	19	250	(3)	356	(11)	76	(8)
8	27	273	(2)	357	(7)	60	(5)
9	27	174	(10)	270	(14)	69	(7)
10	14	-197	(170)	98	(201)	214	(78)
12	27	229	(5)	353	(15)	89	(11)
13	18	365	(11)	460	(15)	69	(7)
15	28	342	(21)	677	(96)	242	(68)
20	19	123	(29)	337	(52)	155	(31)
26	26	299	(4)	393	(10)	68	(6)

TABLE B- 55

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
MEASUREMENT APPLICATIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
6	26	274	(2)	336	(5)	45	(3)
9	30	285	(3)	410	(16)	90	(11)
10	19	183	(16)	372	(39)	136	(26)
11	19	296	(4)	404	(13)	78	(9)
14	19	287	(3)	397	(13)	80	(9)
15	29	239	(4)	347	(13)	78	(9)
21	29	125	(23)	259	(31)	96	(16)
24	19	221	(8)	387	(28)	119	(20)
25	29	291	(3)	388	(10)	70	(7)
29	29	165	(16)	306	(27)	102	(16)
33	19	195	(11)	345	(26)	108	(17)
34	29	251	(3)	381	(17)	93	(12)
35	14	172	(16)	323	(29)	109	(18)
36	30	161	(15)	282	(23)	87	(12)
37	19	164	(11)	242	(14)	54	(6)
40	29	257	(2)	356	(11)	74	(8)

TABLE B- 56

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
PROBABILITY

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	19	202	(6)	282	(10)	58	(6)
3	29	229	(5)	369	(21)	101	(15)
4	28	245	(3)	369	(16)	90	(12)
9	28	246	(3)	345	(11)	72	(8)
11	20	187	(14)	364	(36)	127	(24)
16	29	281	(3)	403	(16)	88	(11)
20	18	218	(5)	314	(11)	69	(7)
23	29	284	(3)	363	(7)	57	(5)
26	29	244	(6)	579	(101)	242	(73)
31	29	285	(5)	484	(39)	143	(28)
32	17	271	(2)	387	(14)	83	(10)
34	31	241	(3)	333	(10)	66	(7)

TABLE B- 57

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
STATISTICS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	19	267	(2)	351	(8)	60	(6)
8	28	224	(4)	289	(6)	47	(4)
18	30	254	(2)	327	(6)	53	(4)
19	18	213	(5)	295	(10)	60	(6)
25	30	141	(18)	256	(24)	83	(12)
28	17	-19	(76)	133	(86)	111	(30)
33	20	81	(31)	169	(34)	63	(11)
35	20	246	(3)	401	(25)	112	(18)
38	18	212	(11)	420	(45)	150	(31)
39	31	351	(17)	533	(38)	131	(25)
40	30	118	(25)	249	(33)	95	(16)

TABLE B- 58

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
TABLES AND GRAPHS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	20	84	(32)	197	(37)	81	(14)
3	30	206	(8)	321	(16)	83	(10)
6	30	151	(15)	250	(20)	71	(9)
12	28	249	(3)	345	(10)	69	(7)
13	19	12	(60)	163	(70)	109	(26)
14	20	102	(27)	218	(32)	84	(13)
15	30	170	(14)	305	(25)	98	(15)
17	29	184	(9)	279	(14)	68	(8)
19	20	196	(7)	271	(9)	54	(5)
20	20	258	(2)	380	(15)	88	(11)
22	19	209	(8)	340	(19)	94	(13)
23	30	275	(2)	400	(16)	90	(11)
30	19	205	(7)	304	(13)	71	(8)
35	17	254	(2)	379	(16)	91	(12)
38	19	12	(63)	184	(76)	124	(31)

TABLE B- 59

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
INTEGRATED APPLICATIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	20	-18	(85)	208	(108)	163	(48)
4	29	208	(6)	290	(10)	59	(6)
5	18	231	(5)	347	(15)	83	(11)
7	19	156	(15)	262	(21)	77	(11)
8	29	-63	(122)	289	(179)	255	(94)
10	20	204	(8)	316	(17)	81	(10)
16	30	161	(15)	269	(21)	78	(11)
21	30	252	(3)	369	(15)	84	(11)
24	20	211	(7)	319	(15)	78	(10)
26	30	272	(2)	368	(10)	69	(7)
27	20	199	(8)	289	(12)	65	(7)
28	20	216	(6)	327	(15)	80	(10)
31	30	149	(17)	256	(23)	77	(11)
32	20	279	(3)	420	(21)	102	(15)
39	30	168	(21)	366	(47)	143	(30)

TABLE B- 60

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT FORMULATIONS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	21	220	(5)	316	(11)	69	(7)
2	21	210	(5)	278	(8)	49	(4)
4	30	139	(18)	242	(23)	74	(10)
5	20	134	(19)	236	(24)	74	(10)
8	31	187	(8)	268	(12)	58	(6)
9	29	230	(8)	454	(49)	161	(35)
10	21	151	(16)	267	(23)	34	(12)
12	30	143	(16)	230	(19)	63	(8)
13	20	109	(28)	248	(37)	100	(18)
15	31	143	(18)	258	(25)	83	(12)
17	30	207	(10)	368	(29)	116	(19)
20	21	314	(6)	435	(17)	87	(11)
36	31	209	(8)	333	(18)	89	(12)
39	27	217	(5)	305	(10)	64	(6)
40	31	153	(15)	259	(21)	76	(10)

TABLE B- 61

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT
ANALYSIS AND STRATEGY

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	31	223	(6)	384	(25)	116	(17)
6	31	200	(8)	312	(15)	81	(9)
7	18	287	(4)	448	(24)	116	(17)
11	21	172	(9)	249	(12)	56	(5)
14	21	135	(20)	279	(30)	104	(16)
16	31	212	(7)	339	(17)	91	(11)
18	31	361	(13)	488	(21)	92	(12)
19	21	123	(17)	208	(20)	61	(7)
21	31	171	(12)	295	(20)	90	(12)
22	20	424	(36)	662	(65)	172	(39)
23	31	179	(11)	301	(19)	88	(11)
24	21	117	(29)	309	(48)	139	(27)
25	31	497	(59)	745	(87)	179	(46)
26	31	193	(7)	273	(10)	58	(5)
27	21	205	(5)	315	(12)	72	(7)
28	21	107	(21)	193	(24)	62	(8)
29	30	112	(28)	282	(42)	123	(22)
30	18	242	(3)	334	(9)	66	(6)
31	31	125	(20)	239	(25)	82	(11)
32	19	77	(30)	169	(33)	67	(11)
33	21	153	(12)	237	(15)	61	(6)
34	30	205	(11)	399	(36)	140	(25)
35	21	277	(3)	444	(26)	120	(19)
37	20	232	(5)	376	(20)	104	(14)
38	20	111	(21)	199	(24)	63	(8)

TABLE B- 62

ITEM PARAMETERS FOR GRADE 6 MATHEMATICS ELEMENT INTERPRETATION

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	31	217	(11)	407	(44)	137	(30)
5	21	322	(8)	440	(19)	85	(13)
7	21	192	(9)	269	(12)	55	(6)
8	30	208	(7)	295	(12)	62	(7)
12	29	317	(6)	414	(14)	70	(9)
13	21	245	(6)	475	(60)	166	(43)
22	21	380	(30)	605	(67)	162	(43)
29	31	144	(24)	280	(35)	99	(19)
30	21	357	(15)	485	(26)	93	(16)
32	21	282	(3)	401	(17)	86	(12)
37	21	277	(2)	427	(27)	108	(19)
38	21	209	(18)	488	(88)	202	(62)

TABLE B- 63

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
PREFIXES, ROOTS, AND SUFFIXES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	11	220	(4)	294	(8)	53	(5)
6	10	644	(191)	1510	(469)	625	(309)
8	10	227	(8)	455	(55)	164	(39)
10	22	183	(8)	253	(10)	51	(5)
14	22	201	(11)	369	(33)	121	(23)
15	10	156	(13)	246	(18)	64	(8)
22	23	154	(15)	259	(21)	76	(10)
24	22	104	(26)	202	(30)	70	(12)
26	10	194	(10)	319	(21)	90	(13)
27	22	447	(68)	827	(154)	274	(99)
29	10	-17	(79)	154	(93)	124	(36)
30	22	171	(9)	240	(12)	50	(5)
35	22	152	(14)	249	(19)	70	(9)
38	22	253	(2)	362	(14)	78	(10)
39	10	192	(7)	272	(11)	58	(6)
40	10	193	(8)	294	(15)	72	(9)

TABLE B- 64

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
GENERAL VOCABULARY

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	22	389	(29)	571	(50)	131	(29)
2	22	203	(7)	294	(12)	66	(8)
5	22	95	(29)	190	(34)	69	(12)
8	12	168	(13)	277	(21)	79	(11)
9	10	167	(23)	399	(64)	167	(43)
18	10	130	(19)	217	(22)	43	(9)
21	10	184	(7)	248	(9)	46	(4)
22	22	173	(10)	251	(13)	56	(6)
26	11	182	(9)	270	(14)	63	(7)
28	22	174	(11)	273	(17)	71	(9)
31	10	110	(27)	226	(34)	83	(15)
32	22	273	(2)	387	(16)	82	(11)
40	12	113	(22)	182	(24)	50	(7)

TABLE B- 65

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
SCIENCE VOCABULARY

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	10	305	(6)	407	(13)	74	(8)
6	11	124	(24)	275	(36)	109	(19)
16	10	183	(8)	271	(13)	64	(7)
17	10	193	(7)	275	(11)	60	(6)
23	10	185	(8)	277	(13)	66	(7)
24	23	190	(6)	248	(7)	42	(3)
25	10	198	(7)	290	(12)	66	(7)
29	11	78	(49)	343	(87)	191	(52)
34	10	128	(16)	201	(18)	52	(6)
37	22	179	(9)	268	(13)	64	(7)
38	23	104	(28)	251	(39)	106	(19)

TABLE B- 66

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
SOCIAL STUDIES VOCABULARY

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	10	182	(11)	306	(21)	89	(13)
11	22	231	(4)	328	(12)	70	(8)
12	10	336	(17)	542	(48)	149	(32)
13	22	71	(42)	236	(56)	119	(26)
14	23	229	(4)	342	(15)	81	(10)
19	22	189	(7)	266	(11)	55	(6)
20	22	187	(8)	276	(13)	64	(7)
27	23	176	(10)	259	(15)	67	(8)
30	23	169	(9)	227	(10)	42	(4)
33	23	191	(11)	331	(25)	101	(16)
35	24	327	(11)	474	(27)	106	(18)
36	11	308	(14)	598	(83)	209	(59)
39	11	238	(3)	347	(14)	79	(10)

TABLE B- 67

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
USING CONTEXT WITH MULTIPLE-MEANING WORDS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	23	144	(13)	226	(16)	59	(7)
4	11	84	(28)	169	(32)	61	(10)
7	22	117	(18)	185	(20)	49	(6)
8	11	111	(20)	171	(21)	43	(6)
15	11	100	(24)	191	(28)	65	(10)
16	11	130	(15)	182	(16)	38	(4)
20	23	168	(11)	274	(18)	76	(10)
24	24	213	(4)	276	(6)	45	(4)
25	11	162	(15)	295	(25)	96	(15)
27	24	183	(8)	275	(13)	66	(7)
32	23	148	(15)	256	(21)	78	(10)
33	22	156	(16)	293	(27)	99	(15)
34	11	-44	(89)	172	(110)	157	(46)
35	23	237	(3)	338	(11)	73	(8)
36	10	235	(3)	345	(13)	79	(9)
39	12	141	(13)	208	(15)	49	(5)
40	11	215	(5)	306	(10)	65	(7)

TABLE B- 68

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
DETAILS FROM A SINGLE SENTENCE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	13	201	(7)	298	(14)	70	(9)
4	12	161	(12)	243	(16)	60	(7)
5	24	140	(16)	220	(19)	58	(8)
7	23	152	(15)	254	(21)	74	(11)
8	14	156	(13)	239	(16)	60	(8)
10	24	187	(8)	264	(11)	56	(6)
17	11	78	(35)	145	(38)	48	(9)
18	11	46	(54)	233	(73)	135	(35)
19	23	166	(11)	254	(16)	64	(8)
25	12	151	(17)	278	(28)	92	(15)
26	12	154	(16)	271	(24)	84	(13)
30	24	147	(13)	218	(16)	51	(6)
33	24	126	(18)	196	(20)	50	(7)
39	13	130	(22)	260	(32)	94	(17)

TABLE B- 69

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
DETAILS FROM TWO OR MORE SENTENCES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	12	125	(30)	344	(58)	158	(35)
7	24	-57	(93)	132	(109)	138	(40)
9	11	128	(21)	257	(29)	93	(15)
11	23	212	(4)	278	(7)	48	(4)
12	11	127	(18)	224	(22)	70	(9)
13	23	133	(16)	225	(20)	67	(9)
14	24	132	(21)	280	(33)	107	(18)
15	12	127	(18)	226	(23)	71	(10)
18	12	157	(11)	239	(14)	59	(6)
19	24	170	(9)	244	(11)	53	(5)
24	25	80	(31)	189	(37)	79	(14)
25	13	171	(9)	243	(11)	52	(5)
26	13	109	(27)	250	(37)	102	(18)
27	25	182	(8)	268	(12)	62	(6)
30	25	127	(19)	230	(24)	75	(10)
36	12	116	(18)	192	(21)	55	(7)
38	24	162	(12)	257	(16)	69	(8)

TABLE B- 70

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
PRONOUN REFERENCES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	13	184	(8)	266	(12)	59	(6)
5	23	114	(22)	203	(26)	64	(10)
6	12	187	(9)	291	(17)	75	(10)
9	13	126	(21)	233	(27)	77	(12)
10	23	185	(10)	304	(20)	85	(12)
12	12	184	(24)	518	(113)	241	(80)
16	12	71	(44)	242	(60)	123	(29)
17	12	174	(10)	266	(15)	66	(8)
18	14	180	(10)	284	(17)	75	(10)
20	24	202	(13)	423	(55)	160	(38)
21	11	86	(30)	173	(34)	63	(11)
26	14	209	(7)	339	(21)	94	(14)
28	24	133	(16)	199	(18)	47	(6)
34	13	79	(37)	220	(47)	101	(21)
37	24	204	(6)	281	(10)	55	(6)
39	14	179	(9)	269	(14)	65	(8)

TABLE B- 71

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT SEQUENCE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	14	220	(5)	324	(13)	75	(8)
5	25	151	(12)	234	(15)	60	(7)
8	13	133	(16)	217	(19)	61	(7)
9	12	106	(28)	260	(40)	111	(20)
13	24	112	(21)	207	(25)	69	(10)
14	27	150	(17)	280	(25)	94	(14)
17	13	227	(4)	337	(13)	79	(9)
18	13	173	(10)	263	(14)	65	(7)
19	25	212	(7)	350	(21)	99	(14)
21	12	120	(18)	203	(21)	60	(8)
27	26	231	(4)	345	(14)	82	(10)
30	26	150	(14)	254	(19)	75	(10)
31	11	139	(21)	292	(33)	110	(19)
36	13	195	(9)	328	(21)	96	(13)
40	13	192	(8)	300	(15)	78	(9)

TABLE B- 72

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT MAIN IDEAS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	15	151	(13)	243	(18)	66	(8)
4	15	109	(26)	238	(35)	93	(16)
11	24	80	(43)	278	(64)	143	(34)
12	13	183	(10)	286	(16)	74	(9)
14	26	192	(11)	337	(26)	105	(17)
15	13	58	(44)	204	(55)	106	(23)
16	13	219	(4)	304	(10)	62	(6)
17	14	178	(10)	273	(15)	68	(8)
18	16	180	(13)	320	(26)	101	(16)
25	14	207	(8)	339	(21)	95	(14)
27	27	188	(6)	250	(8)	45	(4)
30	27	152	(14)	253	(20)	73	(10)
34	14	-206	(195)	145	(245)	254	(107)
37	23	175	(10)	270	(15)	69	(8)
38	26	207	(8)	338	(21)	95	(14)
40	14	99	(32)	255	(44)	113	(22)

TABLE B- 73

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
CAUSE AND EFFECT

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	24	157	(14)	251	(18)	68	(9)
3	14	146	(16)	240	(21)	68	(9)
4	16	194	(6)	252	(8)	42	(4)
5	26	131	(20)	238	(27)	78	(12)
6	14	200	(7)	288	(12)	64	(7)
7	25	61	(42)	161	(47)	72	(15)
11	25	156	(12)	225	(15)	50	(6)
15	14	155	(15)	252	(20)	70	(10)
23	11	125	(27)	288	(43)	117	(24)
24	26	20	(67)	216	(86)	141	(39)
25	15	193	(17)	427	(61)	169	(43)
29	12	147	(17)	248	(22)	73	(11)
35	25	190	(10)	303	(19)	82	(12)
36	14	176	(11)	279	(18)	75	(10)
38	25	211	(7)	331	(19)	87	(13)

TABLE B- 74

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
FOLLOWING ORGANIZATION

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	19	260	(2)	429	(29)	123	(21)
5	30	138	(24)	311	(41)	125	(24)
12	18	202	(7)	307	(15)	76	(9)
13	31	211	(6)	319	(15)	78	(10)
14	28	188	(9)	295	(16)	78	(10)
16	19	238	(4)	382	(22)	104	(16)
17	18	182	(11)	301	(20)	86	(12)
19	31	204	(7)	317	(16)	81	(10)
23	19	257	(2)	362	(12)	76	(9)
27	30	282	(3)	395	(14)	82	(10)
29	19	235	(5)	435	(40)	144	(29)
30	30	242	(3)	405	(28)	118	(20)
33	31	152	(16)	275	(24)	88	(13)
37	30	244	(3)	366	(16)	88	(12)
38	30	223	(5)	335	(15)	81	(10)
39	19	271	(3)	412	(21)	101	(15)

TABLE B- 75

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
PUTTING INFORMATION TOGETHER

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	24	268	(2)	409	(2.)	102	(15)
3	17	185	(10)	298	(18)	82	(11)
11	27	258	(2)	367	(13)	79	(9)
12	16	230	(5)	348	(16)	85	(11)
18	15	177	(10)	269	(15)	67	(8)
19	27	298	(6)	448	(24)	108	(17)
20	27	251	(2)	358	(13)	77	(9)
23	13	150	(15)	246	(19)	69	(7)
25	17	170	(10)	241	(12)	51	(5)
29	15	162	(15)	288	(24)	91	(13)
31	12	213	(7)	336	(18)	89	(12)
32	28	181	(10)	281	(16)	73	(9)
34	18	123	(32)	330	(56)	149	(34)
38	18	229	(5)	356	(18)	92	(13)
40	18	176	(15)	335	(31)	114	(20)

TABLE B- 76

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
PREDICTING OUTCOMES

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	31	89	(30)	214	(37)	90	(16)
2	31	146	(13)	227	(16)	58	(6)
4	19	101	(27)	224	(34)	89	(15)
6	16	150	(16)	265	(22)	82	(11)
10	30	241	(3)	358	(14)	84	(10)
12	17	110	(26)	249	(35)	100	(17)
15	19	169	(18)	362	(42)	139	(27)
16	15	138	(19)	261	(27)	89	(13)
18	18	256	(2)	390	(18)	97	(13)
20	30	168	(16)	320	(29)	110	(18)
23	17	235	(3)	326	(10)	66	(7)
24	28	180	(9)	262	(12)	59	(6)
29	16	231	(3)	316	(9)	61	(6)
32	29	164	(10)	240	(13)	55	(6)
33	26	147	(16)	265	(23)	85	(12)
34	17	410	(40)	689	(85)	201	(54)
35	29	114	(22)	216	(26)	73	(11)
36	19	207	(6)	299	(11)	67	(7)

TABLE B- 77

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
MAKING COMPARISONS AND CONTRASTS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	28	242	(4)	426	(35)	133	(25)
13	27	149	(16)	258	(22)	79	(11)
16	14	124	(26)	275	(38)	109	(20)
17	15	176	(12)	287	(19)	80	(11)
19	29	279	(3)	378	(11)	71	(8)
20	28	160	(14)	272	(21)	81	(11)
21	17	260	(2)	362	(12)	74	(8)
22	29	189	(11)	321	(23)	95	(14)
23	12	178	(18)	378	(46)	144	(31)
24	27	272	(2)	413	(22)	102	(15)
25	18	151	(16)	257	(21)	76	(11)
28	29	178	(10)	270	(14)	66	(8)
29	14	317	(9)	462	(25)	105	(17)
30	28	142	(14)	216	(17)	53	(6)
34	16	256	(2)	427	(31)	124	(22)
33	30	144	(24)	325	(44)	131	(27)
40	17	798	(259)	1440	(404)	463	(223)

TABLE B- 78

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
DRAWING CONCLUSIONS FROM DETAILS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
6	13	139		384	(38)	141	(26)
11	26	246	(2)	332	(8)	62	(5)
17	16	134	(14)	208	(16)	53	(6)
20	25	140	(21)	306	(35)	120	(20)
21	13	160	(11)	247	(14)	63	(6)
22	25	152	(10)	219	(12)	48	(4)
23	14	196	(6)	267	(8)	51	(4)
25	16	248	(3)	456	(39)	150	(28)
26	16	260	(2)	385	(15)	90	(11)
32	25	148	(13)	244	(17)	69	(8)
34	15	253	(2)	400	(21)	106	(15)
36	16	200	(6)	278	(9)	56	(5)
37	25	265	(2)	538	(66)	197	(47)
38	27	126	(18)	229	(22)	74	(10)
39	15	218	(6)	364	(21)	105	(15)
40	15	264	(2)	484	(43)	158	(31)

TABLE B- 79

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
DRAWING CONCLUSIONS FROM OVERALL MEANING

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	30	170	(11)	268	(17)	71	(9)
2	29	151	(14)	244	(18)	67	(8)
6	15	192	(8)	283	(13)	65	(7)
7	31	67	(53)	310	(85)	175	(48)
9	14	119	(20)	200	(23)	59	(8)
11	29	196	(6)	257	(8)	44	(4)
13	29	110	(23)	206	(28)	69	(11)
21	19	171	(12)	276	(18)	75	(10)
23	16	104	(31)	260	(44)	113	(22)
31	19	133	(19)	242	(25)	78	(12)
34	19	200	(7)	291	(12)	65	(7)
37	27	208	(6)	295	(11)	63	(7)
38	31	136	(15)	206	(17)	51	(6)
39	17	240	(3)	344	(12)	75	(9)

TABLE B- 80

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
ANALYZING CHARACTER

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	27	137	(18)	258	(25)	87	(12)
2	25	148	(11)	208	(12)	43	(4)
4	17	80	(31)	192	(37)	81	(14)
7	29	146	(15)	252	(21)	76	(10)
9	17	153	(16)	280	(24)	92	(13)
10	28	250	(2)	372	(15)	88	(11)
12	15	162	(18)	329	(34)	121	(21)
13	26	118	(20)	208	(23)	66	(9)
14	30	151	(13)	243	(17)	66	(8)
15	15	210	(6)	303	(11)	67	(7)
18	17	142	(14)	232	(18)	64	(8)
19	26	157	(15)	279	(23)	88	(12)
21	16	186	(7)	253	(9)	49	(4)
27	28	227	(5)	357	(18)	93	(12)
28	28	216	(5)	316	(12)	73	(8)
31	14	153	(13)	249	(18)	69	(8)
35	27	122	(17)	195	(19)	53	(6)
36	15	94	(26)	195	(31)	73	(11)

TABLE B- 81

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
IDENTIFYING SETTING

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	26	122	(20)	193	(23)	51	(8)
2	26	173	(10)	251	(14)	56	(7)
8	15	1	(76)	176	(92)	126	(38)
9	16	123	(22)	218	(27)	68	(11)
10	26	145	(19)	261	(27)	84	(14)
15	16	123	(26)	256	(37)	96	(19)
21	14	197	(11)	342	(28)	105	(19)
22	24	48	(52)	197	(64)	108	(27)
26	15	192	(8)	275	(12)	60	(7)
28	26	177	(9)	241	(11)	47	(5)
32	26	138	(18)	237	(24)	71	(11)
35	28	201	(8)	308	(17)	78	(11)

TABLE B- 82

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
SUMMARIZING PLOT

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	25	167	(12)	262	(17)	68	(9)
2	30	161	(13)	253	(17)	66	(9)
7	26	140	(16)	223	(20)	60	(8)
8	19	132	(21)	247	(28)	83	(14)
9	18	150	(16)	255	(22)	75	(11)
15	18	163	(11)	231	(13)	50	(5)
21	18	167	(13)	272	(19)	75	(11)
22	28	179	(14)	328	(30)	107	(19)
26	18	170	(15)	303	(27)	96	(16)
28	31	158	(14)	259	(20)	73	(10)
31	17	300	(8)	459	(30)	115	(21)
32	27	189	(6)	249	(8)	44	(4)
35	26	96	(43)	317	(73)	159	(43)

TABLE B- 83

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
UNDERSTANDING DIALOGUE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	23	176	(9)	253	(12)	56	(6)
2	28	148	(13)	221	(15)	53	(6)
7	28	155	(14)	254	(19)	71	(9)
8	17	168	(9)	224	(10)	40	(4)
9	15	55	(43)	173	(50)	85	(18)
15	17	151	(14)	238	(18)	63	(8)
21	15	149	(20)	308	(36)	115	(21)
22	27	155	(12)	229	(14)	53	(6)
26	17	201	(10)	358	(28)	113	(19)
28	25	155	(13)	240	(16)	61	(7)
31	13	189	(9)	293	(16)	75	(9)
33	25	191	(9)	298	(16)	77	(10)

TABLE B- 84

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
SENSING MOOD

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
2	27	210	(5)	295	(10)	61	(6)
7	27	196	(8)	295	(14)	71	(8)
8	18	212	(7)	338	(19)	91	(13)
10	25	148	(32)	433	(87)	206	(59)
12	14	129	(21)	246	(28)	84	(14)
19	30	195	(8)	289	(13)	67	(8)
22	30	174	(9)	257	(13)	59	(6)
26	19	169	(14)	303	(25)	97	(15)
28	30	254	(2)	406	(24)	109	(18)
31	18	194	(12)	353	(30)	115	(20)
32	30	218	(4)	297	(9)	57	(5)
35	31	142	(16)	232	(19)	65	(8)

TABLE B- 85

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
UNDERSTANDING FIGURATIVE LANGUAGE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	29	139	(14)	218	(17)	58	(7)
10	27	163	(11)	250	(15)	62	(7)
13	25	145	(13)	210	(15)	47	(5)
14	25	166	(11)	259	(16)	67	(8)
28	23	174	(7)	214	(7)	29	(2)
29	13	-90	(146)	374	(244)	335	(141)
30	29	170	(9)	240	(11)	51	(5)
31	16	168	(16)	323	(31)	111	(20)
32	24	102	(24)	191	(28)	64	(10)
34	12	163	(12)	256	(16)	67	(8)
37	26	221	(5)	339	(16)	85	(11)
39	16	149	(19)	296	(32)	106	(18)

TABLE B- 86

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
DETECTING AUTHOR AND AUTHOR'S ATTITUDE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
5	28	75	(47)	292	(73)	156	(40)
8	16	275	(4)	468	(39)	139	(28)
10	29	188	(10)	299	(18)	80	(11)
14	31	258	(2)	358	(11)	72	(8)
20	29	185	(8)	269	(12)	60	(7)
22	26	267	(2)	382	(15)	83	(11)
24	29	119	(22)	225	(28)	77	(12)
28	27	182	(7)	240	(8)	42	(4)
31	15	155	(13)	241	(17)	62	(8)
33	28	190	(10)	318	(22)	92	(14)
36	17	202	(7)	303	(14)	73	(9)
37	31	199	(9)	318	(19)	86	(12)

TABLE B- 87

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
DETECTING AUTHOR'S PURPOSE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	18	150	(13)	248	(18)	70	(8)
5	29	160	(11)	247	(15)	63	(7)
6	18	190	(8)	293	(15)	75	(9)
7	30	144	(16)	256	(22)	81	(11)
9	19	133	(16)	223	(20)	65	(8)
10	31	182	(7)	252	(10)	51	(5)
11	30	176	(10)	270	(14)	68	(8)
13	30	119	(19)	212	(23)	67	(9)
16	17	165	(11)	256	(15)	66	(7)
22	31	207	(5)	294	(10)	63	(6)
24	30	320	(17)	618	(82)	215	(58)
25	19	160	(13)	268	(19)	78	(10)
27	29	184	(7)	262	(10)	56	(5)
29	18	115	(20)	212	(24)	70	(10)
32	31	181	(8)	261	(11)	58	(6)
33	29	173	(11)	277	(17)	76	(9)
37	29	215	(6)	348	(19)	96	(13)
38	29	176	(12)	311	(23)	97	(14)
40	19	204	(9)	371	(30)	121	(20)

TABLE B- 88

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
SEPARATING FACT FROM OPINION

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	16	209	(5)	291	(9)	59	(5)
4	18	206	(7)	310	(14)	75	(9)
5	27	190	(9)	293	(15)	74	(9)
6	17	213	(6)	309	(12)	70	(7)
11	28	174	(11)	284	(18)	79	(10)
13	28	160	(14)	275	(21)	83	(11)
16	16	144	(15)	245	(20)	73	(10)
17	17	174	(9)	248	(11)	54	(5)
19	28	191	(7)	258	(9)	49	(4)
20	26	172	(10)	260	(14)	63	(7)
23	15	203	(7)	308	(14)	76	(9)
29	17	139	(18)	262	(25)	88	(13)
33	27	261	(2)	382	(15)	88	(11)
36	18	177	(9)	268	(14)	65	(7)
37	28	236	(3)	333	(11)	70	(7)
40	16	331	(13)	521	(38)	137	(26)

TABLE B- 89

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
APPLICATIONS TO A DIFFERENT CONTEXT

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
5	31	176	(14)	306	(25)	94	(15)
6	19	198	(9)	321	(20)	89	(13)
11	31	139	(17)	229	(21)	66	(9)
12	19	196	(10)	321	(21)	90	(13)
14	29	203	(7)	306	(15)	74	(9)
16	18	172	(12)	271	(17)	71	(9)
17	19	137	(19)	246	(25)	79	(12)
18	19	217	(6)	328	(16)	81	(10)
20	31	186	(9)	280	(14)	68	(8)
23	18	169	(16)	313	(29)	104	(18)
24	31	215	(7)	341	(19)	91	(13)
27	31	508	(103)	998	(229)	353	(147)
30	31	183	(10)	281	(16)	70	(9)
33	30	180	(11)	284	(17)	75	(10)
39	18	86	(35)	220	(44)	97	(20)

TABLE B- 90

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
REFERENCE MATERIALS AND PARTS OF A BOOK

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	8	133	(18)	229	(23)	69	(10)
5	8	150	(16)	261	(23)	81	(12)
6	8	130	(16)	198	(19)	49	(6)
3	8	186	(7)	255	(10)	50	(5)
9	8	65	(39)	141	(42)	55	(11)
11	8	211	(5)	292	(10)	59	(6)
12	7	177	(16)	351	(38)	125	(25)
13	8	115	(1)	194	(24)	57	(8)
20	8	55	(5)	210	(58)	112	(26)
22	8	76	(24)	177	(39)	72	(14)
23	8	191	(7)	269	(11)	56	(6)
26	9	161	(12)	245	(15)	60	(7)
31	9	138	(20)	262	(29)	90	(15)
32	8	103	(25)	236	(28)	60	(10)
40	7	139	(13)	195	(15)	40	(4)

TABLE B- 91

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
MAPS, GRAPHS, AND CHARTS

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
21	23	68	(36)	173	(40)	76	(14)
25	22	75	(38)	230	(50)	112	(23)
28	12	252	(2)	348	(10)	69	(7)
38	15	175	(13)	303	(23)	92	(14)
31	26	159	(15)	282	(23)	88	(13)
15	30	188	(9)	286	(15)	71	(8)
17	29	184	(8)	270	(12)	62	(7)
12	28	241	(3)	344	(12)	74	(9)
14	20	43	(49)	198	(61)	112	(26)
19	20	185	(8)	266	(12)	58	(6)
22	19	209	(7)	324	(16)	83	(11)
27	20	168	(14)	294	(23)	91	(13)
2	9	128	(18)	224	(23)	69	(10)
10	8	76	(34)	192	(40)	83	(15)
29	8	-20	(77)	131	(88)	110	(30)

TABLE B- 92

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF LITERATURE PASSAGES: LITERAL

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
7	23	155	(13)	255	(18)	72	(9)
8	14	167	(9)	241	(12)	53	(5)
10	24	184	(8)	267	(12)	60	(6)
26	12	166	(12)	270	(17)	75	(9)
7	24	78	(31)	184	(36)	76	(13)
9	11	180	(8)	253	(10)	53	(5)
15	12	97	(28)	221	(35)	89	(15)
26	13	144	(15)	249	(20)	76	(10)
9	13	164	(10)	237	(12)	52	(5)
10	23	176	(12)	312	(23)	97	(14)
21	11	112	(19)	184	(21)	52	(7)
26	14	214	(6)	332	(16)	85	(11)
28	24	73	(32)	174	(36)	73	(12)
8	13	160	(9)	222	(11)	45	(4)
9	12	172	(9)	254	(13)	59	(6)
21	12	104	(22)	196	(26)	67	(10)
31	11	133	(22)	291	(35)	113	(20)

TABLE B- 93

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF LITERATURE PASSAGES: INFERENTIAL

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
15	13	47	(45)	205	(55)	114	(23)
2	24	148	(14)	253	(19)	76	(9)
7	25	56	(37)	160	(41)	75	(13)
15	14	154	(13)	254	(18)	72	(8)
35	25	189	(10)	309	(18)	87	(11)
1	24	269	(2)	457	(31)	135	(23)
31	12	200	(10)	357	(26)	114	(17)
32	28	194	(7)	275	(10)	59	(5)
1	31	107	(22)	218	(27)	80	(11)
2	31	155	(11)	228	(13)	53	(5)
10	30	240	(4)	373	(17)	96	(12)
15	19	184	(13)	347	(29)	117	(19)
32	29	174	(8)	241	(10)	48	(4)
35	29	131	(16)	219	(19)	64	(8)
1	28	245	(4)	426	(30)	131	(21)
21	17	262	(2)	368	(11)	76	(8)
22	29	182	(12)	332	(25)	108	(16)
28	29	154	(15)	277	(22)	89	(12)
35	30	163	(16)	316	(28)	111	(17)
21	13	180	(8)	251	(10)	51	(4)
22	25	136	(14)	217	(17)	58	(6)
26	16	264	(2)	421	(23)	114	(16)
32	25	179	(8)	247	(9)	49	(4)
1	30	157	(14)	274	(20)	84	(11)
2	29	176	(8)	246	(10)	51	(4)
7	31	86	(40)	309	(64)	161	(36)
9	14	91	(26)	191	(30)	72	(11)
21	19	182	(9)	276	(13)	68	(7)
31	19	136	(17)	244	(22)	79	(10)

TABLE B- 94

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF LITERATURE PASSAGES: INTERPRETIVE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
1	27	154	(12)	257	(16)	74	(8)
2	25	146	(10)	206	(11)	43	(3)
7	29	143	(15)	253	(19)	79	(9)
9	17	145	(17)	283	(25)	100	(14)
10	28	249	(3)	405	(21)	113	(15)
15	15	201	(7)	315	(14)	82	(9)
21	16	176	(8)	255	(11)	57	(5)
28	28	222	(4)	311	(9)	64	(6)
31	14	124	(19)	249	(25)	90	(12)
35	27	127	(14)	196	(15)	50	(5)
1	26	109	(18)	187	(20)	57	(6)
2	26	161	(10)	254	(14)	67	(6)
8	15	-102	(109)	147	(132)	181	(54)
9	16	87	(27)	211	(32)	89	(13)
10	26	80	(35)	271	(50)	138	(26)
15	16	80	(35)	262	(49)	132	(25)
21	14	181	(14)	381	(37)	144	(25)
22	24	72	(31)	206	(37)	96	(15)
26	15	173	(11)	290	(17)	84	(10)
28	26	164	(9)	242	(12)	57	(5)
32	26	156	(11)	240	(13)	61	(6)
35	28	178	(13)	341	(27)	118	(17)
1	25	142	(16)	269	(23)	91	(12)
2	30	157	(11)	255	(15)	71	(7)
7	26	136	(14)	224	(17)	63	(7)
8	19	131	(17)	250	(23)	86	(11)
9	18	130	(18)	259	(25)	93	(13)
15	18	122	(18)	226	(22)	75	(9)
21	18	158	(13)	279	(20)	87	(11)
22	28	187	(10)	329	(21)	102	(13)
26	18	151	(18)	322	(32)	124	(19)
28	31	176	(8)	260	(11)	61	(5)
31	17	336	(16)	612	(64)	199	(45)
32	27	172	(9)	252	(11)	58	(5)
35	26	76	(44)	331	(73)	184	(42)
1	23	163	(10)	255	(13)	66	(6)
2	28	156	(9)	222	(11)	48	(4)
7	28	135	(17)	256	(23)	87	(11)
8	17	121	(17)	212	(20)	66	(8)
9	15	31	(44)	164	(50)	96	(18)
15	17	113	(21)	235	(27)	88	(12)
21	15	154	(16)	311	(28)	113	(17)
22	27	144	(12)	226	(15)	60	(6)
26	17	194	(12)	382	(32)	136	(22)

TABLE B- 94, CONTINUED

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF LITERATURE PASSAGES: INTERPRETIVE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
28	25	150	(12)	240	(15)	65	(7)
31	13	170	(13)	307	(22)	99	(13)
2	27	200	(7)	310	(13)	80	(8)
7	27	173	(13)	317	(23)	104	(14)
8	18	204	(9)	366	(25)	117	(17)
10	25	132	(36)	471	(98)	244	(66)
22	30	167	(10)	259	(13)	67	(6)
26	19	146	(19)	323	(35)	128	(21)
28	30	257	(2)	457	(33)	144	(24)
31	18	189	(12)	370	(31)	131	(21)
32	30	211	(6)	311	(11)	72	(7)
35	31	130	(16)	231	(20)	73	(8)
1	29	133	(14)	221	(17)	63	(7)
10	27	135	(17)	256	(23)	87	(11)
28	23	150	(10)	208	(11)	41	(3)
31	16	137	(25)	363	(52)	163	(32)
32	24	122	(15)	200	(17)	56	(6)

TABLE B- 95

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF LITERATURE PASSAGES: CRITICAL/APPLICATIVE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
8	16	280	(5)	516	(52)	170	(37)
10	29	205	(6)	288	(10)	60	(6)
22	26	267	(2)	369	(11)	74	(8)
28	27	161	(10)	237	(13)	55	(5)
31	15	118	(22)	237	(28)	86	(13)
7	30	151	(14)	256	(19)	76	(10)
9	19	138	(14)	224	(18)	62	(7)
10	31	189	(6)	252	(8)	45	(4)
22	31	202	(7)	300	(12)	71	(8)
32	31	180	(8)	262	(11)	59	(6)

TABLE B- 96

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF SCIENCE PASSAGES: LITERAL

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	13	208	(5)	296	(10)	63	(6)
5	24	175	(7)	228	(8)	38	(3)
17	11	64	(35)	137	(37)	52	(9)
25	12	162	(13)	278	(20)	84	(11)
3	12	177	(12)	309	(22)	95	(13)
24	25	86	(28)	191	(33)	76	(12)
25	13	159	(11)	242	(14)	60	(6)
38	24	126	(21)	260	(31)	97	(16)
5	23	166	(8)	218	(9)	37	(3)
6	12	144	(21)	318	(38)	125	(23)
16	12	74	(38)	242	(51)	121	(25)
17	12	146	(17)	272	(25)	91	(13)
34	13	71	(36)	219	(46)	107	(20)
37	24	202	(6)	283	(9)	58	(5)
5	25	177	(7)	235	(9)	42	(3)
17	13	229	(4)	324	(10)	68	(7)
40	13	183	(10)	302	(18)	86	(11)

TABLE B- 97

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF SCIENCE PASSAGES: INFERENTIAL

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
3	15	148	(13)	245	(16)	70	(7)
16	13	203	(8)	338	(19)	97	(12)
17	14	173	(10)	278	(15)	76	(8)
25	14	204	(8)	356	(23)	109	(15)
34	14	-264	(210)	135	(264)	288	(115)
37	23	187	(7)	270	(10)	60	(5)
38	26	211	(7)	343	(17)	95	(12)
40	14	76	(35)	259	(50)	132	(25)
3	14	132	(16)	239	(20)	77	(9)
5	26	79	(32)	234	(42)	112	(19)
6	14	197	(7)	293	(12)	69	(7)
23	11	91	(34)	298	(54)	149	(30)
24	26	52	(11)	222	(53)	123	(24)
25	15	180	(20)	471	(73)	209	(50)
29	12	120	(20)	247	(27)	92	(13)
38	25	208	(7)	342	(18)	97	(12)
3	19	263	(2)	512	(50)	179	(36)
5	30	137	(22)	316	(37)	129	(22)
16	19	240	(4)	395	(22)	112	(15)
17	18	180	(10)	307	(19)	91	(11)
23	19	260	(2)	362	(10)	73	(7)
29	19	244	(3)	398	(21)	111	(15)
37	30	246	(3)	375	(15)	94	(11)
38	30	225	(5)	340	(13)	83	(9)
3	17	186	(8)	294	(14)	78	(8)
23	13	134	(16)	242	(21)	78	(10)
25	17	147	(12)	235	(15)	63	(7)
29	15	127	(23)	296	(36)	122	(20)
34	18	133	(23)	322	(41)	136	(24)
38	28	226	(5)	358	(17)	95	(11)
40	18	175	(13)	333	(27)	115	(17)
6	16	147	(15)	264	(21)	84	(10)
16	15	121	(21.	261	(30)	101	(15)
23	17	235	(3)	324	(8)	64	(5)
24	28	161	(11)	264	(16)	74	(8)
29	16	227	(4)	323	(10)	70	(6)
34	17	407	(34)	679	(73)	197	(47)
16	14	104	(28)	278	(42)	125	(33)
17	15	182	(9)	284	(14)	74	(9)
23	12	179	(15)	378	(38)	143	(25)
24	27	280	(4)	512	(45)	167	(32)
25	18	132	(18)	257	(25)	90	(12)
29	14	320	(8)	465	(21)	105	(14)

TABLE B- 97, CONTINUED

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF SCIENCE PASSAGES: INFERENTIAL

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
34	16	256	(2)	469	(39)	154	(28)
40	17	758	(211)	1350	(329)	427	(182)
6	13	212	(7)	347	(18)	97	(12)
17	16	112	(19)	202	(22)	65	(8)
23	14	197	(6)	268	(8)	51	(4)
25	16	252	(3)	434	(29)	131	(21)
34	15	253	(3)	433	(28)	130	(20)
37	25	267	(2)	566	(72)	216	(52)
38	27	149	(12)	233	(14)	61	(6)
40	15	267	(2)	508	(48)	174	(35)
6	15	178	(10)	291	(16)	81	(9)
23	16	162	(11)	257	(15)	69	(7)
34	19	189	(8)	300	(15)	80	(9)
37	27	210	(5)	294	(9)	61	(5)
38	31	127	(15)	202	(17)	54	(6)

TABLE B- 98

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF SCIENCE PASSAGES: CRITICAL/APPLICATIVE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
5	28	107	(30)	288	(46)	131	(25)
24	29	120	(19)	226	(24)	77	(10)
37	31	214	(5)	304	(10)	65	(6)
3	18	165	(10)	249	(13)	61	(6)
5	29	177	(8)	248	(10)	51	(5)
6	18	184	(10)	300	(17)	84	(10)
16	17	163	(11)	257	(15)	68	(7)
24	30	310	(11)	550	(51)	173	(36)
25	19	151	(14)	270	(21)	86	(11)
29	18	130	(15)	216	(18)	62	(7)
37	29	217	(6)	350	(18)	96	(12)
38	29	182	(11)	310	(20)	92	(12)
40	19	200	(11)	386	(34)	134	(23)
3	16	207	(5)	291	(9)	61	(5)
5	27	203	(6)	284	(9)	59	(5)
6	17	214	(5)	307	(10)	67	(7)
16	16	150	(13)	245	(17)	68	(8)
17	17	167	(9)	247	(12)	58	(6)
23	15	195	(8)	314	(16)	85	(10)
29	17	136	(18)	261	(25)	90	(12)
37	28	235	(3)	332	(10)	70	(7)
40	16	321	(9)	481	(26)	116	(17)
5	31	189	(9)	299	(15)	79	(9)
6	19	201	(8)	320	(16)	86	(11)
16	18	180	(9)	269	(12)	64	(6)
17	19	123	(20)	245	(27)	88	(13)
23	18	148	(20)	328	(37)	130	(23)
24	31	202	(9)	369	(28)	121	(19)

TABLE B- 99

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF SOCIAL SCIENCE PASSAGES: LITERAL

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	12	145	(13)	243	(17)	71	(8)
18	11	51	(43)	234	(57)	133	(27)
19	23	166	(10)	255	(13)	64	(7)
30	24	140	(12)	215	(14)	54	(5)
33	24	82	(26)	177	(30)	69	(10)
39	13	137	(17)	260	(23)	89	(12)
11	23	186	(8)	294	(14)	78	(9)
12	11	108	(21)	220	(26)	80	(11)
13	23	131	(15)	223	(18)	67	(8)
14	24	107	(28)	285	(43)	129	(23)
18	12	168	(8)	237	(10)	50	(4)
19	24	184	(6)	242	(7)	42	(3)
27	25	166	(11)	270	(16)	75	(8)
30	25	135	(15)	230	(18)	68	(8)
36	12	103	(20)	186	(22)	60	(7)
4	13	159	(12)	271	(18)	80	(10)
12	12	183	(21)	525	(97)	246	(69)
18	14	175	(10)	285	(16)	80	(9)
20	24	190	(16)	462	(65)	196	(45)
39	14	155	(13)	274	(20)	86	(11)
4	14	216	(5)	324	(12)	78	(8)
13	24	111	(19)	204	(22)	67	(8)
14	27	152	(14)	275	(21)	89	(11)
18	13	177	(8)	258	(11)	58	(5)
19	25	209	(7)	350	(20)	102	(14)
27	26	226	(4)	351	(15)	90	(11)
30	26	163	(10)	251	(13)	63	(6)
36	13	191	(9)	326	(20)	97	(13)

TABLE B-100

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF SOCIAL SCIENCE PASSAGES: INFERENTIAL

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	15	114	(21)	241	(28)	91	(13)
11	24	97	(30)	280	(45)	132	(24)
12	13	193	(7)	286	(11)	67	(6)
14	26	198	(9)	339	(20)	102	(13)
18	16	163	(16)	341	(33)	129	(21)
27	27	159	(11)	254	(15)	69	(7)
30	27	140	(15)	256	(21)	83	(10)
4	16	142	(15)	256	(20)	87	(10)
11	25	152	(10)	223	(12)	51	(5)
36	14	149	(15)	288	(24)	100	(14)
12	18	191	(9)	322	(19)	94	(12)
13	31	205	(7)	333	(17)	92	(11)
14	28	179	(10)	304	(18)	90	(11)
19	31	197	(8)	329	(18)	95	(12)
27	30	295	(5)	461	(24)	120	(17)
30	30	242	(4)	427	(29)	133	(21)
33	31	115	(24)	284	(37)	122	(20)
39	19	274	(3)	418	(18)	104	(13)
11	27	257	(2)	365	(11)	78	(8)
12	16	230	(4)	342	(12)	81	(8)
18	15	161	(11)	268	(17)	77	(9)
19	27	303	(7)	485	(29)	131	(20)
20	27	249	(3)	363	(12)	82	(9)
4	19	69	(34)	216	(42)	107	(19)
12	17	127	(18)	248	(24)	87	(12)
18	18	255	(2)	393	(17)	99	(12)
20	30	156	(17)	326	(32)	123	(19)
33	26	126	(19)	264	(28)	100	(14)
36	19	190	(8)	309	(16)	86	(10)
13	27	141	(15)	257	(21)	84	(10)
19	29	286	(4)	416	(16)	94	(11)
20	28	145	(16)	274	(23)	94	(12)
30	28	100	(21)	202	(25)	73	(10)
11	26	248	(3)	337	(8)	65	(6)
20	25	160	(14)	299	(23)	100	(14)
36	16	193	(7)	282	(10)	64	(6)
39	15	215	(7)	376	(24)	116	(16)
11	29	180	(8)	258	(10)	57	(5)
13	29	118	(17)	208	(20)	65	(8)
39	17	237	(4)	368	(16)	95	(11)

TABLE B-101

ITEM PARAMETERS FOR GRADE 6 READING ELEMENT
COMPREHENSION OF SOCIAL SCIENCE PASSAGES: INTERPRETIVE

FORM	ITEM	50-PERCENT THRESHOLD	S.E.	80-PERCENT THRESHOLD	S.E.	DISPERSION	S.E.
4	17	71	(35)	186	(41)	83	(15)
12	15	170	(14)	314	(27)	104	(17)
13	26	154	(10)	216	(12)	45	(4)
14	30	188	(6)	240	(7)	37	(3)
18	17	114	(22)	223	(27)	79	(12)
19	26	171	(10)	270	(16)	72	(9)
27	28	225	(4)	344	(16)	86	(11)
36	15	67	(35)	183	(41)	83	(15)
33	25	167	(14)	310	(27)	103	(17)
12	14	117	(23)	242	(31)	91	(15)
19	30	196	(7)	284	(11)	63	(7)
13	25	153	(10)	213	(12)	43	(4)
14	25	201	(4)	253	(6)	37	(3)
30	29	158	(11)	240	(15)	59	(7)
39	16	61	(56)	335	(96)	198	(56)

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