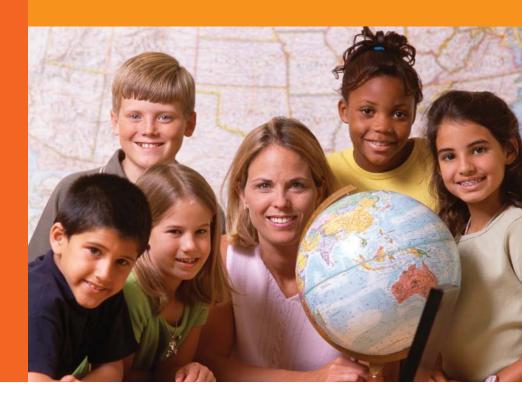# CTP 4
Content Standards
Manual

ERB : **CTP** COMPREHENSIVE
TESTING PROGRAM

The Comprehensive Testing Program is a diagnostic instructional tool that works best when administered in the natural flow of the school year.

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Introduction

The Comprehensive Testing Program 4th Edition tests (CTP 4) were designed to collect basic information about student achievement in key areas: listening, reading, vocabulary, writing, and mathematics. In addition, CTP 4 includes two tests for students in grades 3 through 11 that measure verbal and quantitative reasoning ability. CTP 4 also includes optional constructed-response questions at every level. These questions require students to write short answers to open-ended questions in reading and mathematics.

Verbal Tests

The CTP 4 Verbal tests were developed to align with the National Council of Teachers of English/International Reading Association *Standards for English Language Arts* (1996), which emphasizes the development of reading and language skills necessary for effective communication both in academic settings and in the world beyond the classroom.

The CTP 4 Verbal tests assess students in the following areas: Word Analysis, Auditory Comprehension, Reading Comprehension, Writing Mechanics, Writing Concepts and Skills, Verbal Reasoning, and Vocabulary. Each of these seven tests represents a distinct facet of verbal ability, but the skills measured are interrelated, and the tests should be considered parts of a whole. The skills and concepts tested in each test at each level build on one another as well as on skills already mastered. At Levels 1 and 2, for example, the Word Analysis tests specifically emphasize the phonemic awareness and decoding skills that are vital for beginning readers. But decoding skills are also required throughout the Reading Comprehension and Vocabulary tests at levels 3-10.

Schools may choose to administer the CTP 4 constructed-response component of the Reading Comprehension tests. The content covered in the questions is similar to that covered in the Reading Comprehension tests. The distinction is that the constructed-response tests specifically require students to communicate their thoughts in writing.

Mathematics Tests

The CTP 4 Mathematics tests consist of Mathematics Achievement tests, Constructed Response Mathematics tests, Quantitative Reasoning tests, and an Algebra I test. Each test includes questions that assess students' understanding and application of a variety of content and process areas in mathematics. The National Council of Teachers of Mathematics *Principles and Standards for School Mathematics* (2000) presents mathematics content areas important for students in grades K through 12 and groups them under five main categories: Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability. The CTP 4 Mathematics Achievement tests assess content areas that parallel the NCTM's categories, with slight modifications that are appropriate for each grade level. As with the NCTM's categories, the CTP 4 Mathematics content areas should be viewed as complementary rather than exclusive.

Schools may choose to administer the CTP 4 constructed-response tests in mathematics. These tests are a component of the achievement tests. The content covered in the questions is similar to that covered in the multiplechoice achievement tests. The distinction is that the constructed-response tests specifically assess students' ability to communicate in mathematics.

In addition to the content areas in the multiple-choice component of the achievement tests, students are assessed in the following mathematical processes: Conceptual Understanding, Procedural Knowledge, and Problem Solving. Likewise, in the constructed-response component of the achievement tests, students are also assessed in Mathematical Communication. Questions that are classified under Conceptual Understanding tend to ask students to recognize and manipulate fundamental ideas in mathematics. Questions that are classified under Procedural Knowledge tend to ask students to recall factual information about mathematics or to demonstrate understanding of basic algorithms. Questions that are classified under Problem Solving tend to ask students to apply and integrate concepts or to identify appropriate strategies.

Levels 3 to 10 of the CTP 4 include Quantitative Reasoning tests to assess students' ability to engage, in age-level appropriate ways, in pattern recognition, classification, and reasoning in all content areas, including logic, arithmetic, algebra, geometry, probability, and statistics. In the questions, students must use mathematics to make comparisons, formulate extensions or generalizations of mathematical concepts, and analyze mathematical situations.

For levels 5 through 10 of the CTP 4 Mathematics Tests, calculators are allowed on one section of the multiple-choice achievement tests. In the NCTM Standards, the responsible use of calculators is encouraged. Technology is said to "aid in assessment," by allowing an alternate means to examine students' processes. However, the NCTM Standards also state that "technology should not be used as a replacement for basic understandings and intuitions." The CTP 4 tests do not allow the use of calculators on any of the following tests: the constructed-response component of the achievement tests, the Quantitative Reasoning tests, and the Algebra I test.

Overview

This book provides detailed information about the content areas and skills tested by the CTP 4 tests, as well as sample questions with correct answers and explanations.

Scope and Sequence

The Scope and Sequence charts provide an overview of the general content areas tested at each level of the CTP 4 tests, along with the number of questions in each content category at each level.

Content Category Information

The content category descriptions provide more detailed information about the concepts and skills tested by the CTP 4 tests at each level. At some levels, specific skills are linked to sample questions that appear later in the book; the relevant sample questions are indicated by boxed references in the text, e.g.,

Sample Questions and Explanations

The sample questions are intended to provide a general idea of the kinds of questions that will appear on the CTP 4 tests. The questions in this book were all administered operationally in pilot tests and represent a cross section of the content areas and skills assessed in operational tests. The questions are clustered into groups by level, and each question is followed by an explanation of the correct answer and an indication of the content category exemplified by the question. For the sample constructed-response questions in reading comprehension and mathematics, brief explanations of the criteria for scoring have been provided.

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
SCOPE AND SEQUENCE **CTP 4 VERBAL TESTS**										
Spring to Fall Grades	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11
Word Analysis	**50**	**50**								
Sight Words	12	8								
Phonic Analysis	27	25								
Structural Analysis	11	17								
Auditory Comprehension	**40**	**40**	**40**							
Vocabulary in Context	8	8	8							
Explicit Information	13	8	16							
Inference	10	11	8							
Analysis	9	13	8							
Reading Comprehension	**32**	**32**	**37**	**37**	**37**	**37**	**37**	**37**	**37**	**37**
Vocabulary in Context	8	8	8							
Explicit Information	8	8	14	17	14	14	13	15	15	13
Inference	8	8	7	11	14	13	15	12	10	12
Analysis	8	8	8	9	9	10	9	10	12	12
Reading for Understanding*	4	4	4	4	4	4	4	4	4	4
Writing Mechanics		**45**	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**45**
Spelling		12	10	10	10	10				
Capitalization		12	10	10	8	7				
Punctuation		12	10	10	11	12				
Usage		9	15	15	16	16	19	19	23	23
Spelling, Capitalization, Punctuation (Combined)							18	18	22	22
Sentence Construction							8	8		
Writing Concepts & Skills			**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**
Organization			15	16	14	13	15	17	16	14
Purpose, Audience, Focus			10	10	10	11	10	8	8	13
Supporting Details			17	16	14	14	15	15	15	14
Style and Craft			8	8	12	12	10	10	11	9
Verbal Reasoning			**45**	**45**	**45**	**45**	**45**	**45**	**45**	**45**
Analogical Reasoning			17	17	16	16	15	15	14	14
Categorical Reasoning			14	13	12	12	15	15	12	13
Logical Reasoning			14	15	17	17	15	15	19	18
Vocabulary				**34**	**35**	**35**	**35**	**35**	**35**	**35**
Word Meanings				12	13	11	13	13	18	18
Precision				9	9	9	8	8	8	8
Application				13	13	15	14	14	9	9

* Optional constructed-response section

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
SCOPE AND SEQUENCE **CTP 4 MATHEMATICS TESTS**										
Spring to Fall Grades	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11
Math Achievement	**37**	**37**	**84**	**84**	**84**	**84**	**84**	**84**	**84**	**84**
Number Sense and Operations with Whole Numbers	16	15	34	28						
Number Sense and Operations with Fractions and Decimals			8	13						
Number Systems and Number Theory					14	13	13	9		
Numbers and Number Relationships					14	12	12	13	14	10
Geometry and Spatial Sense	8	7	13	13	12	13	12	12	25	24
Measurement	7	6	13	12	12	12	13	13		
Probability					9	9	9	8		
Statistics					10	10	9	8		
Pre-Algebra					13	15	16	21		
Data Analysis, Statistics and Probability	3	3	8	8					13	9
Patterns, Functions, and Pre-Algebra	3	6	8	10						
Algebra									32	22
Functions										19
Math Communication*	8	8	8	8	8	8	8	8	8	8
Conceptual Understanding	12	14	35	31	27	28	30	31	28	28
Procedural Knowledge	12	10	23	24	28	28	28	26	28	28
Problem Solving	13	13	26	29	29	28	26	27	28	28
Quantitative Reasoning			**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**
Comparison			20	20	20	24	16	18	15	16
Extensions/Generalizations			17	17	17	17	14	19	22	16
Analysis			13	13	13	9	20	13	13	18
Algebra I								**45**	**45**	
Expressions, Statements, Matrices								12	12	
Equations & Inequalities								15	15	
Tables, Graphs, and Algebraic Geometry								10	10	
Situations Involving Variable Quantities								8	8	

*Optional constructed-response section

Level 1

Auditory Comprehension

The CTP 4 Auditory Comprehension test at Level 1 measures students' ability to understand and interpret information presented orally. In addition to being able to listen to and follow the directions for taking the test itself, students must also be able to recognize and understand important words and plot points and to interpret and analyze information presented in a story read aloud. The development of good listening skills parallels and reinforces the development of good reading skills, and the skills tested in the Auditory Comprehension test therefore parallel those tested in the Reading Comprehension test.

The following is a list of the skills measured by the CTP 4 Auditory Comprehension test at Level 1.

Vocabulary in Context
The student will be able to use context clues to determine the meaning of a word or phrase in a text read aloud and choose the correct definition or synonym.

Explicit Information
The student will be able to identify explicit details from a passage read aloud and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text.

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Inference
The student will be able to
• use implicit information from a passage read aloud to make inferences about the motives or behaviors of characters
• use implicit information from a passage read aloud to summarize or draw conclusions

Analysis
The student will be able to
• draw connections between and among various pieces of information in a text read aloud
• synthesize explicit and implicit information to make predictions or draw conclusions about a text read aloud

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 1 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text," including "word identification strategies" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 1.

Vocabulary in Context
The student will be able to use context clues to determine the meaning of a word or phrase in a text and choose the correct definition or synonym.

Sample Question 3, page 78

Explicit Information
The student will be able to identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text.

Inference
The student will be able to
· use implicit information from a passage to make inferences about the motives or behaviors of characters
· use implicit information from a passage to summarize or draw conclusions

Sample Questions 2 and 4, pages 78 and 80

Analysis
The student will be able to
· draw connections between and among various pieces of information in a text

Sample Question 5, page 80

· synthesize explicit and implicit information to make predictions or draw conclusions about a text

Sample Question 1, page 77

Reading for Understanding (optional constructed-response section)
Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 1, most of the questions focus on information that is explicitly stated in the passages. The student will be able to
· describe the main idea of a passage
· describe a supporting idea in a passage

Sample Question 1, page 81

· compare and contrast elements from two texts

Sample Question 2, page 82

· synthesize information from two texts to make predictions or draw conclusions

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Word Analysis

Systematic vocabulary development is essential for reading fluency, and building phonemic awareness — learning the sound structure of language — is important for students in grades 1-3. Students must be able not only to recognize familiar words but to decode unfamiliar ones. The CTP 4 Word Analysis test at Level 1 measures students' ability to recognize and decode words. In addition, the test measures understanding of basic structural elements of the English language, including morphemes and root/base words.

The following is a list of the skills measured by the CTP 4 Word Analysis test at Level 1.

Sight Words
The student will be able to recognize common words that are vital to reading fluency, especially those that do not follow basic rules of sound-letter correspondence.

Phonemic Analysis
The student will be able to recognize vowel and consonant sounds and blends in varying positions within a word (initial, medial, and final).

Structural Analysis
The student will be able to
• recognize compound words

Sample Question 3, page 84

• understand the correct use of contractions and what they mean
• choose the root/base word with the appropriate inflectional ending in the context of a sentence

Mathematics Achievement

The five content strands in the Level 1 Mathematics Achievement test are 1) Numbers and Operations with Whole Numbers; 2) Geometry and Spatial Sense; 3) Measurement; 4) Data Analysis, Statistics, and Probability; and 5) Patterns, Functions, and Pre-Algebra. Along with subscores in the content areas, students receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 1.

Number Sense and Operations with Whole Numbers

The student will be able to

- use place value, read, write, and compare whole numbers, use models to represent numbers, and use expanded notation
- add and subtract whole numbers, multiply single-digit numbers, know the language of basic operations, understand the relationship between addition and multiplication, and estimate sums, differences, products, and quotients
- understand the properties of arithmetic operations, including operations with zero, understand even and odd numbers, and multiply by multiples of 10
- solve real-life problems involving number operations, including basic money problems

Sample Question 3, page 87

Geometry and Spatial Sense

The student will be able to

- identify basic geometric figures and describe shapes, including circles, triangles, and rectangles

Sample Question 4, page 87

- understand basic properties of figures, including closure, number of sides, vertices, and angles, and characterize lines as intersecting or parallel

Sample Question 2, page 86

- identify relationships between figures and images under transformations; identify lines of symmetry and the effects of combining, subdividing, and changing basic shapes; and graph coordinates on a map grid

Measurement

The student will be able to

- know the approximate sizes of customary and metric units and the relationships between measures within the same system and select appropriate units of measure
- work with the basic measure of perimeter and area
- solve real-life problems involving coins, elapsed time, calendars, temperature, weight, or distance and read time on a standard clock and degrees on a thermometer

Data Analysis, Statistics, and Probability

The student will be able to read and interpret various types of simple graphs, including bar, line, circle, pictorial graphs, and tables and tallies.

Patterns, Functions, and Pre-Algebra

The student will be able to

- recognize a wide variety of patterns and the rules that explain them
- select number sentences to represent problem situations

Sample Question 1, page 86

Math Communication (optional constructed-response section)
The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: completing charts, making graphs, writing number sentences, understanding monetary units represented by coins, extending patterns, and constructing geometric figures to represent problems.

Level 2

Auditory Comprehension

The CTP 4 Auditory Comprehension test at Level 2 measures students' ability to understand and interpret information presented orally. In addition to being able to listen to and follow the directions for taking the test itself, students must also be able to recognize and understand important words and plot points and to interpret and analyze information presented in a story read aloud. The development of good listening skills parallels and reinforces the development of good reading skills, and the skills tested in the Auditory Comprehension test therefore parallel those tested in the Reading Comprehension test.

The following is a list of the skills measured by the CTP 4 Auditory Comprehension test at Level 2.

Vocabulary in Context
The student will be able to use context clues to determine the meaning of a word or phrase in a text read aloud and choose the correct definition or synonym.

Explicit Information
The student will be able to identify explicit details from a passage read aloud and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text.

Inference
The student will be able to
- use implicit information from a passage read aloud to make inferences about the motives or behaviors of characters
- use implicit information from a passage read aloud to summarize or draw conclusions

Analysis
The student will be able to
- draw connections between and among various pieces of information in a text read aloud
- synthesize explicit and implicit information to make predictions or draw conclusions about a text read aloud

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 2 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text," including "word identification strategies" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 2.

Vocabulary in Context
The student will be able to use context clues to determine the meaning of a word or phrase in a text and choose the correct definition or synonym.

Explicit Information
The student will be able to
- use explicit information to identify the main idea or primary purpose of a text or part of a text
- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text

Inference
The student will be able to
- use implicit information from a passage to make inferences about the motives or behaviors of characters
- use implicit information from a passage to summarize or draw conclusions

Analysis
The student will be able to
- draw connections between and among various pieces of information in a text
- synthesize explicit and implicit information to make predictions or draw conclusions about a text

Reading for Understanding (optional constructed-response section)
Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 2, most of the questions focus on information that is explicitly stated in the passages. The student will be able to

- describe the main idea of a passage
- describe a supporting idea in a passage
- compare and contrast elements from two texts
- synthesize information from two texts to make predictions or draw conclusions

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Word Analysis

Systematic vocabulary development is essential for reading fluency, and building phonemic awareness — learning the sound structure of language — is important for students in grades 1-3. Students must be able not only to recognize familiar words but to decode unfamiliar ones. The CTP 4 Word Analysis test at Level 2 measures students' ability to recognize and decode words and to choose words appropriate for the context of a sentence or passage. In addition, the test measures students' increasingly sophisticated understanding of basic structural elements of the English

language, including morphemes and root/base words and correct plural and adjectival forms.

The following is a list of the skills measured by the CTP 4 Word Analysis test at Level 2.

Sight Words
The student will be able to recognize common words that are vital to reading fluency, especially those that do not follow basic rules of sound-letter correspondence.

Phonemic Analysis
The student will be able to recognize vowel and consonant sounds and blends in varying positions within a word (initial, medial, and final).

Structural Analysis
The student will be able to
- recognize compound words
- understand the correct use of contractions and what they mean
- choose the root/base word with the appropriate inflectional ending in the context of a sentence
- choose the correct plural form of a word in context
- understand the correct use of comparative and superlative adjectives
- use context clues to choose the appropriate word to fill in a blank in a sentence

Writing Mechanics

The development of a foundational understanding of language conventions and mechanics is essential as students move from copying letters and words to writing sentences to composing paragraphs. The NCTE/IRA *Standards for the English Language Arts* indicates that students should be able to "apply knowledge of language structure and language conventions (e.g., spelling and punctuation) . . . to create, critique, and discuss print and non-print texts" (36). The CTP 4 Writing Mechanics test at Level 2 measures students' growing understanding of English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing Mechanics test at Level 2.

Spelling
The student will be able to identify misspellings of commonly used words, including words with affixes and words that display improper pluralization.

Capitalization
The student will be able to recognize correct and incorrect capitalization. Specific rules tested include
- capitalization of proper nouns
- capitalization of the first word of a sentence

Punctuation

The student will be able to recognize correct and incorrect punctuation. Specific rules tested include
- proper punctuation for dialogue and letter writing
- correct end punctuation
- the correct use of the comma
- the correct use of the apostrophe in contractions and possessives

Sample Question 1, page 85

Usage

The student will be able to apply rules of English diction and grammar. Specific rules tested include
- correct pronoun use, including pronoun-antecedent agreement
- rules of diction within the context of a sentence
- correct verb form and tense, including subject-verb agreement

Sample Question 2, page 85

Mathematics Achievement

The five content strands in the Level 2 Mathematics Achievement test are 1) Numbers and Operations with Whole Numbers; 2) Geometry and Spatial Sense; 3) Measurement; 4) Data Analysis, Statistics, and Probability; and 5) Patterns, Functions, and Pre-Algebra. The content strands for Level 2 are the same as the Level 1 content strands; however, the questions are appropriately more challenging. Additionally, Level 2 contains a few more questions on Patterns, Functions, and Pre-Algebra than Level 1, and there are topics included in Level 2 that are not included in Level 1. These topics are
- understanding the basic concept of chance
- understanding the basic concept of an equality relationship

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 2.

Number Sense and Operations with Whole Numbers

The student will be able to
- use place value, read, write, and compare whole numbers, use models to represent numbers, and use expanded notation
- add and subtract whole numbers, multiply single-digit numbers, know the language of basic operations, understand the relationship between addition and multiplication, and estimate sums, differences, products, and quotients
- understand the properties of arithmetic operations, including operations with zero, understand even and odd numbers, and multiply by multiples of 10
- solve real-life problems involving number operations, including basic money problems

Geometry and Spatial Sense

The student will be able to

- identify basic geometric figures and describe shapes, including circles, triangles, and rectangles
- understand basic properties of figures, including closure, number of sides, vertices, and angles, and characterize lines as intersecting or parallel
- identify relationships between figures and images under transformations; identify lines of symmetry and the effects of combining, subdividing, and changing basic shapes; and graph coordinates on a map grid

Measurement

The student will be able to

- know the approximate sizes of customary and metric units and the relationships between measures within the same system and select appropriate units of measure
- work with the basic measure of perimeter and area
- solve real-life problems involving coins, elapsed time, calendars, temperature, weight, or distance, and read time on a standard clock and degrees on a thermometer

Data Analysis, Statistics, and Probability

The student will be able to

- read and interpret various types of simple graphs, including bar, line, circle, pictorial, table, and tallies
- understand the concept of chance

Patterns, Functions, and Pre-Algebra

The student will be able to

- recognize a wide variety of patterns and the rules that explain them
- select number sentences to represent problem situations
- understand the concept of equality

Math Communication (optional constructed-response section)

The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: listing mathematically sound results for a problem, naming geometric shapes, and displaying lines of symmetry.

Level 3

Verbal Reasoning

The CTP 4 Verbal Reasoning test at Level 3 measures students' ability to conceptualize relationships among words and concepts and to draw conclusions based on incomplete information. The ability to infer information that is not explicitly stated in a text is an essential aspect of fluency in reading; the CTP 4 Verbal Reasoning test at Level 3 evaluates students' developing proficiency in this area.

The following is a list of the skills measured by the CTP 4 Verbal Reasoning test at Level 3.

Analogical Reasoning
The student will be able to
• recognize the relationship between two words and identify another pair of words with the same relationship

> Sample Question 1, page 90

• identify the definition that accurately describes the relationship between a pair of words

Categorical Reasoning
The student will be able to
• recognize which of several elements does or does not fit into a thematically grouped list of words
• generalize about a thematically grouped list of words and choose an appropriate heading for the list

Logical Reasoning
The student will be able to
• solve deductive ordering problems and draw conclusions that are directly deducible from the information provided
• solve inductive reasoning problems by reasoning from details or evidence to a generalization or hypothesis that makes sense of the evidence

> Sample Question 2, page 91

Auditory Comprehension

The CTP 4 Auditory Comprehension test at Level 3 measures students' ability to understand and interpret information presented orally. In addition to being able to listen to and follow the directions for taking the test itself, students must also be able to recognize and understand important words and plot points and to interpret and analyze information presented in a story read aloud. The development of good listening skills parallels and reinforces the development of good reading skills, and the skills tested in the Auditory Comprehension test therefore parallel those tested in the Reading Comprehension test.

The following is a list of the skills measured by the CTP 4 Auditory Comprehension test at Level 3.

Vocabulary in Context

The student will be able to use context clues to determine the meaning of a word or phrase in a text read aloud and choose the correct definition or synonym.

Sample Question 2, page 93

Explicit Information

The student will be able to
- use explicit information to identify the main idea or primary purpose of a text or part of a text
- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text

Sample Question 1, page 92

Inference

The student will be able to
- use implicit information from a passage read aloud to make inferences about the motives or behaviors of characters

Sample Question 3, page 93

- use implicit information from a passage read aloud to summarize or draw conclusions

Analysis

The student will be able to
- draw connections between and among various pieces of information in a text read aloud
- synthesize explicit and implicit information to make predictions or draw conclusions about a text read aloud

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 3 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text," including "word identification strategies" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 3.

Vocabulary in Context

The student will be able to use context clues to determine the meaning of a word or phrase in a text and choose the correct definition or synonym.

Explicit Information

The student will be able to

- use explicit information to identify the main idea or primary purpose of a text or part of a text

Sample Question 2, page 95

- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text

Sample Question 1, page 95

Inference

The student will be able to

- use implicit information from a passage to summarize or draw conclusions
- use implicit information from a passage to make inferences about the motives or behaviors of characters

Sample Question 4, page 96

Analysis

The student will be able to

- draw connections between and among various pieces of information in a text
- synthesize explicit and implicit information to make predictions or draw conclusions about a text

Sample Question 3, page 96

Reading for Understanding (optional constructed-response section)
Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 3, some questions require students to make elementary inferences about information that is not explicitly stated in the text. The student will be able to

- describe the main idea of a passage
- describe a supporting idea in a passage

Sample Question 1, page 97

- compare and contrast elements from two texts
- synthesize information from two texts to make predictions or draw conclusions

Sample Question 2, page 99

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Writing Mechanics

The development of a foundational understanding of language conventions and mechanics is essential as students move from copying letters and words to writing sentences to composing paragraphs. The NCTE/IRA *Standards for the English Language Arts* indicates that students should be able to "apply knowledge of language structure and language conventions (e.g., spelling and punctuation) . . . to create, critique, and discuss print and non-print texts" (36). The CTP 4 Writing Mechanics test at Level 3 measures students' growing understanding of English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing Mechanics test at Level 3.

Spelling
The student will be able to identify misspellings of commonly used words, including words with affixes and words that display improper pluralization.

Capitalization
The student will be able to recognize correct and incorrect capitalization. Specific rules tested include
- capitalization of proper nouns

> Sample Question 2, page 101

- capitalization of the first word of a sentence
- capitalization in titles and forms of address

Punctuation
The student will be able to recognize correct and incorrect punctuation. Specific rules tested include
- the correct use of the comma
- the correct use of the apostrophe in contractions and possessives
- proper punctuation for dialogue and letter writing
- correct end punctuation

> Sample Question 1, page 101

Usage
The student will be able to apply rules of English diction and grammar. Specific rules tested include
- correct pronoun use, including pronoun-antecedent agreement
- correct verb form and tense, including subject-verb agreement
- rules of correct and effective expression at the sentence level, including proper modification
- rules of diction within the context of a sentence
- rules of sentence boundaries, including avoiding run-ons and fragments

Writing Concepts and Skills

The CTP 4 Writing Concepts and Skills test at Level 3 begins to integrate students' developing facility with English grammar and usage with a growing understanding of writing and the writing process. As students begin to develop more comprehensive paragraphs and to learn the stages of the writing process, the ability to organize complex information and to recognize the multiple purposes and audiences for writing becomes increasingly important. According to the NCTE/IRA *Standards for the English Language Arts*, it is important that students be able to "employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes" (35).

The following is a list of the skills measured by the CTP 4 Writing Concepts and Skills test at Level 3.

Organization
The student will be able to
- recognize thesis statements, topic sentences, and conclusions

> Sample Question 4, page 103

- recognize effective transitions between ideas, sentences, and paragraphs
- effectively and logically sequence information within a paragraph or passage

Purpose, Audience, and Focus
The student will be able to
- recognize the role of the audience within varying contexts and draw logical conclusions about the intended audience for a given passage
- understand how the purpose for and focus of a piece of writing help determine the kind of information included and the appropriate style and tone of the piece

> Sample Question 2, page 102

Supporting Details
The student will be able to
- choose the appropriate main idea or topic sentence for a paragraph
- identify effective and relevant details to support a given idea or thesis

> Sample Question 3, page 103

Style and Craft
The student will be able to
- effectively combine two or more sentences into one logical sentence
- recognize and identify accurate and appropriate word choices in a piece of writing
- recognize and identify well-crafted sentences that exhibit rhetorical precision

> Sample Question 1, page 102

Mathematics Achievement

The six content strands in the Level 3 Mathematics Achievement test are 1) Numbers and Operations with Whole Numbers; 2) Numbers and Operations with Fractions and Decimals; 3) Geometry and Spatial Sense; 4) Measurement; 5) Data Analysis, Statistics, and Probability; and 6) Patterns, Functions, and Pre-Algebra. The content strands for Level 3 differ from those for Level 2 in the addition of the strand about fractions and decimals. Even where the strands are the same, some topics are included in Level 3 but not in Level 2. Examples of such topics are

- using two- and three-dimensional models to represent whole numbers
- dividing whole numbers, including understanding the meaning of remainder
- understanding the concepts of mode and range

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 3.

Number Sense and Operations with Whole Numbers
The student will be able to
- use place value; read, write, and compare whole numbers; use models to represent, order, and compare whole numbers; and understand expanded notation
- perform arithmetic operations on whole numbers, know the language of basic operations, understand the relationship between addition and multiplication, and estimate sums, difference, products, and quotients
- understand the properties of arithmetic operations, including operations with zero, understand even and odd numbers, and multiply by multiples of 10

- solve real-life problems involving number operations

Number Sense and Operations with Fractions and Decimals
The student will be able to
- use place value in relation to decimal numbers, recognize relative magnitude of fractions and decimals, and use models to represent order of fractions and decimals
- add and subtract simple fractions and find half of an even number
- solve real-life problems involving fractions and decimals, including money problems

Geometry and Spatial Sense

The student will be able to

- use basic geometric language to describe and name shapes, including circles, triangles, and rectangles
- understand basic properties of figures, including number of sides, vertices, and angles, and characterize lines as intersecting or parallel
- identify relationships between figures and images under transformation and identify lines of symmetry and the effects of combining, subdividing, and changing basic shapes

Measurement

The student will be able to

- understand approximate sizes in customary and metric units and the relationships between measures within the same system

Sample Question 2, page 106

- use appropriate units of measurement and appropriate tools for a given measurement and understand basic measure of perimeter and area
- solve real-life problems involving coins, elapsed time, calendars, temperature, weight, or distance

Data Analysis, Statistics, and Probability

The student will be able to

- read and interpret various types of simple graphs, including bar, line, circle, pictorial, tables, and tallies
- understand the concepts of mean, mode, and range
- understand the concept of chance

Patterns, Functions, and Pre-Algebra

The student will be able to

- recognize a wide variety of patterns and the rules that explain them
- solve simple open sentences involving operations on whole numbers and select number sentences to represent problem situations

Math Communication (optional constructed-response section)

The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: plotting points on a grid, estimating solutions, and graphically representing fractions.

Sample Questions 1 and 2, pages 108 and 109

Quantitative Reasoning

The Quantitative Reasoning test assesses students' ability to engage, in age-level appropriate ways, in pattern recognition, classification, and reasoning in all content areas, including logic, arithmetic, algebra, geometry, probability, and statistics.

The following is a list of the skills measured by the CTP 4 Quantitative Reasoning test at Level 3.

Comparison

The student will be able to

- consider numerical quantities in various forms and compare their sizes

Sample Question 1, page 104

- consider the relative measures of geometric shapes
- recognize relative sizes of units of measure, including between systems

Extensions and Generalizations

The student will be able to

- formulate arithmetic conclusions based on observation and mathematical judgment
- formulate geometric conclusions based on observation and mathematical judgment
- recognize patterns and geometric representation of real-life situations

Sample Question 2, page 105

Analysis

The student will be able to

- interpret symbolic representation of numerical quantities
- interpret charts, graphs, statistical measures, and basic probability
- model geometric transformations

Level 4

Verbal Reasoning

The CTP 4 Verbal Reasoning test at Level 4 measures students' ability to conceptualize relationships among words and concepts and to draw conclusions based on incomplete information. The ability to infer information that is not explicitly stated in a text is an essential aspect of fluency in reading; the CTP 4 Verbal Reasoning test at Level 4 evaluates students' developing proficiency in this area.

The following is a list of the skills measured by the CTP 4 Verbal Reasoning test at Level 4.

Analogical Reasoning
The student will be able to
- recognize the relationship between two words and identify another pair of words with the same relationship
- identify the definition that accurately describes the relationship between a pair of words

Categorical Reasoning
The student will be able to
- recognize which of several elements does or does not fit into a thematically grouped list of words
- generalize about a thematically grouped list of words and choose an appropriate heading for the list

Logical Reasoning
The student will be able to
- solve deductive ordering problems and draw conclusions that are directly deducible from the information provided
- solve inductive reasoning problems by reasoning from details or evidence to a generalization or hypothesis that makes sense of the evidence

Vocabulary

Reading fluency depends on both an extensive learned vocabulary and the ability to decode unfamiliar words. The CTP 4 Vocabulary test at Level 4 measures students' expanding vocabulary and their developing ability to distinguish more subtle differences among related words. At Level 4, vocabulary words are tested exclusively in the context of a sentence or passage.

The following is a list of the skills measured by the CTP 4 Vocabulary test at Level 4.

Word Meaning
The student will be able to
- understand the meaning of a word in the context of a sentence and identify the correct definition
- understand the meaning of a word in the context of a sentence and identify a synonym for that word
- understand the meaning of a word in the context of a sentence and identify an antonym of that word

Precision

The student will be able to distinguish among subtle shades of meaning in choosing the appropriate word or words to fill in the blank(s) in a sentence.

Application

The student will be able to
- understand the meaning of a word in the context of a passage and identify the correct definition
- understand the meaning of a word in the context of a passage and identify a synonym for that word
- understand the meaning of a word in the context of a passage and identify an antonym of that word

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 4 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 4.

Explicit Information

The student will be able to
- use explicit information to identify the main idea or primary purpose of a text or part of a text
- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text

Inference

The student will be able to
- use implicit information from a passage to make inferences about the motives or behaviors of characters
- use implicit information from a passage to answer specific questions about a text

Analysis

The student will be able to
- determine whether information included in a passage consists of fact or opinion
- use explicit and implicit information to determine the author's likely intent for writing a passage or for including certain information in a passage
- synthesize explicit and implicit information to make predictions, draw conclusions, or formulate hypotheses about a text

Reading for Understanding (optional constructed-response section)
Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 4, some questions require students to make elementary inferences about information that is not explicitly stated in the text. The student will be able to
- describe the main idea of a passage
- describe a supporting idea in a passage
- compare and contrast elements from two texts
- make inferences about a character's feelings or motivation
- synthesize information from two texts to describe supporting ideas, make predictions, or draw conclusions

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Writing Mechanics

The development of a foundational understanding of language conventions and mechanics is essential as students move from copying letters and words to writing sentences to composing paragraphs. The NCTE/IRA *Standards for the English Language Arts* indicates that students should be able to "apply knowledge of language structure and language conventions (e.g., spelling and punctuation) … to create, critique, and discuss print and non-print texts" (36). The CTP 4 Writing Mechanics test at Level 4 measures students' growing understanding of English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing Mechanics test at Level 4.

Spelling
The student will be able to identify misspellings of commonly used words, including words with affixes and words that display improper pluralization.

Capitalization
The student will be able to recognize correct and incorrect capitalization. Specific rules tested include
- capitalization of proper nouns
- capitalization of the first word of a sentence
- capitalization in titles and forms of address

Punctuation
The student will be able to recognize correct and incorrect punctuation. Specific rules tested include
- the correct use of the comma
- the correct use of the apostrophe in contractions and possessives
- proper punctuation for dialogue and letter writing
- correct end punctuation

Usage
The student will be able to apply rules of English diction and grammar.
Specific rules tested include
- correct pronoun use, including pronoun-antecedent agreement
- correct verb form and tense, including subject-verb agreement and parallelism
- rules of correct and effective expression at the sentence level, including proper modification
- rules of diction within the context of a sentence
- rules of sentence boundaries, including avoiding run-ons and fragments

Writing Concepts and Skills

The CTP 4 Writing Concepts and Skills test at Level 4 integrates students' developing facility with English grammar and usage with a growing understanding of writing and the writing process. As students begin to develop more comprehensive paragraphs and to learn the stages of the writing process, the ability to organize complex information and to recognize the multiple purposes and audiences for writing becomes increasingly important. According to the NCTE/IRA *Standards for the English Language Arts*, it is important that students be able to "employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes" (35).

The following is a list of the skills measured by the CTP 4 Writing Concepts and Skills test at Level 4.

Organization
The student will be able to
- recognize thesis statements, topic sentences, and conclusions
- recognize effective transitions between ideas, sentences, and paragraphs
- effectively and logically sequence information within a paragraph or passage

Purpose, Audience, and Focus
The student will be able to
- recognize the role of the audience within varying contexts and draw logical conclusions about the intended audience for a given passage
- understand how the purpose for and focus of a piece of writing help determine the kind of information included and the appropriate style and tone of the piece

Supporting Details
The student will be able to
- identify effective and relevant details to support a given idea or thesis
- choose the appropriate main idea or topic sentence for a paragraph

Style and Craft
The student will be able to
- effectively combine two or more sentences into one logical sentence
- recognize and identify accurate and appropriate word choices in a piece of writing
- recognize and identify well-crafted sentences that exhibit rhetorical precision

Mathematics Achievement

The six content strands in the Level 4 Mathematics Achievement test are 1) Numbers and Operations with Whole Numbers; 2) Numbers and Operations with Fractions and Decimals; 3) Geometry and Spatial Sense; 4) Measurement; 5) Data Analysis, Statistics, and Probability; and 6) Patterns, Functions, and Pre-Algebra. Some topics included in Level 4 but not in Level 3 are

- using powers of ten
- understanding squares of numbers
- understanding properties such as the commutative property, associative property, and the use of parentheses
- comparing fractions with unlike denominators
- modeling simple percents such as 25%, 50%, and 75%
- adding and subtracting fractions with like denominators or simple fractions with unlike denominators (e.g., halves and fourths)
- naming and describing simple three-dimensional figures
- naming the types of angles
- understanding a wider range of units of measurement, such as some units of capacity and mass
- finding the mean, median, and mode of a set of data
- using simple sample spaces to find probabilities
- using basic counting techniques
- understanding the concept of a variable

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 4.

Number Sense and Operations with Whole Numbers
The student will be able to
- use place value; read, write, and compare whole numbers; and use models to represent, order, and compare whole numbers
- understand expanded notation, powers of ten, and squares of numbers
- perform arithmetic operations on whole numbers, know the language of basic operations, understand the relationship between addition and multiplication, and estimate sums, difference, products, and quotients
- understand the properties of arithmetic operations, including operations with zero, understand even and odd numbers, and multiply and divide by multiples of 10
- solve real-life problems involving number operations and rate problems

Number Sense and Operations with Fractions and Decimals
The student will be able to
- use place value in relation to decimal numbers, recognize relative magnitude of fractions and decimals, use models to represent order of fractions and decimals, and estimate fractions and decimals with pictures
- add and subtract decimals and simple fractions and mixed numbers
- multiply and divide amounts of money by a single digit and find half of an even number and a quarter of a multiple of 4
- solve real-life problems involving fractions and decimals

Geometry and Spatial Sense

The student will be able to
- use basic geometric language to describe and name shapes and identify segments, rays, lines, and angles
- understand basic properties of figures, including number of sides, vertices, angles, edges, and faces and characterize lines as intersecting, parallel, or perpendicular and angles as right, acute, or obtuse
- identify relationships between figures and images under transformation and identify lines of symmetry and the effects of combining, subdividing, and changing basic shapes

Measurement

The student will be able to
- understand approximate sizes in customary and metric units and the relationships between measures within the same system
- use appropriate units of measurement and appropriate tools for a given measurement
- understand the basic measures of perimeter and area
- solve real-life problems involving elapsed time, calendars, temperature, capacity, weight, distance, or map scale

Data Analysis, Statistics, and Probability

The student will be able to
- read and interpret various types of simple graphs, including bar, line, circle, pictorial, tables, and tallies
- understand and compute mean, median, mode, and range
- understand the concept of chance and basic counting techniques used to describe an event

Patterns, Functions, and Pre-Algebra

The student will be able to
- recognize a wide variety of patterns and the rules that explain them and understand graphs of coordinates
- solve simple open sentences, including inequalities and select number sentences to represent problem situations
- understand the basic concept of an equality relationship and the concept of a variable

Math Communication (optional constructed-response section)

The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: solving problems that involve multiplication and division, showing alternate ways to solve a problem, generalizing output of a function machine, and interpreting a Venn diagram.

Quantitative Reasoning

The Quantitative Reasoning test assesses students' ability to engage, in age-level appropriate ways, in pattern recognition, classification, and reasoning in all content areas, including logic, arithmetic, algebra, geometry, probability, and statistics.

The following is a list of the skills measured by the CTP 4 Quantitative Reasoning test at Level 4.

Comparison
The student will be able to
- consider numerical quantities in various forms and compare their sizes
- consider the relative measures of geometric shapes
- recognize relative sizes of units of measure, including between systems

Extensions and Generalizations
The student will be able to
- formulate arithmetic conclusions based on observation and mathematical judgment
- formulate geometric conclusions based on observation and mathematical judgment
- recognize patterns and geometric representation of real-life situations

Analysis
The student will be able to
- interpret symbolic representation of numerical quantities
- interpret charts, graphs, statistical measures, and probability
- model geometric transformations

Level 5

Verbal Reasoning

The CTP 4 Verbal Reasoning test at Level 5 measures students' ability to conceptualize relationships among words and concepts and to draw conclusions based on incomplete information. The ability to infer information that is not explicitly stated in a text is an essential aspect of fluency in reading; the CTP 4 Verbal Reasoning test at Level 5 evaluates students' developing proficiency in this area.

The following is a list of the skills measured by the CTP 4 Verbal Reasoning test at Level 5.

Analogical Reasoning
The student will be able to
- recognize the relationship between two words and identify another pair of words with the same relationship
- identify the definition that accurately describes the relationship between a pair of words

Categorical Reasoning
The student will be able to
- recognize which of several elements does or does not fit into a thematically grouped list of words
- generalize about a thematically grouped list of words and choose an appropriate heading for the list

Logical Reasoning
The student will be able to
- solve deductive ordering problems and draw conclusions that are directly deducible from the information provided
- solve inductive reasoning problems by reasoning from details or evidence to a generalization or hypothesis that makes sense of the evidence

Vocabulary

Reading fluency depends on both an extensive learned vocabulary and the ability to decode unfamiliar words. The CTP 4 Vocabulary test at Level 5 measures students' expanding vocabulary and their developing ability to distinguish more subtle differences among related words. At Level 5, vocabulary words are tested exclusively in the context of a sentence or passage.

The following is a list of the skills measured by the CTP 4 Vocabulary test at Level 5.

Word Meaning
The student will be able to
- understand the meaning of a word in the context of a sentence and identify the correct definition
- understand the meaning of a word in the context of a sentence and identify a synonym for that word
- understand the meaning of a word in the context of a sentence and identify an antonym of that word

Precision
The student will be able to distinguish among subtle shades of meaning in choosing the appropriate word or words to fill in the blank(s) in a sentence.

Application
The student will be able to
- understand the meaning of a word in the context of a passage and identify a synonym for that word
- understand the meaning of a word in the context of a passage and identify an antonym of that word

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 5 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 5.

Explicit Information
The student will be able to
- use explicit information to identify the main idea or primary purpose of a text or part of a text
- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text
- understand connections between and among explicit pieces of information from a passage
- put pieces of information from the passage in the correct chronological order

Inference
The student will be able to
- use implicit information from a passage to make inferences about the motives or behaviors of characters
- use implicit information from a passage to answer specific questions about a text

Analysis
The student will be able to
- determine whether information included in a passage consists of fact or opinion
- use explicit and implicit information to determine the author's likely intent for writing a passage or for including certain information in a passage
- recognize cause-and-effect relationships among elements in a text
- categorize and combine pieces of information in a text
- synthesize explicit and implicit information to make predictions, draw conclusions, or formulate hypotheses about a text

Reading for Understanding (optional constructed-response section)
Students use their developing productive language skills to answer
questions about text, employing comprehension strategies to interpret
and analyze the texts, describe important aspects of the texts, synthesize
information from two texts, and compare and contrast elements within a
text and/or between two texts. At level 5, some questions require students
to make inferences about information that is not explicitly stated in the
text. The student will be able to

- describe the main idea of a passage
- describe a supporting idea in a passage
- compare and contrast elements from two texts
- make inferences about a character's feelings or motivation
- synthesize information from two texts to describe supporting ideas,
  make predictions, or draw conclusions

Note: Although the Reading for Understanding section does require
students to write their answers, it is a test of reading comprehension and
not writing ability. Students' responses are evaluated based on how
completely and thoroughly they answer the questions; misspellings,
grammatical mistakes, and other writing errors do not count against them.
The questions are scored on a 0-2 scale.

Writing Mechanics

The development of a foundational understanding of language
conventions and mechanics is essential as students begin to write more
complex texts. The NCTE/IRA *Standards for the English Language Arts*
indicates that students should be able to "apply knowledge of language
structure and language conventions (e.g., spelling and punctuation) . . . to
create, critique, and discuss print and non-print texts" (36). The CTP 4
Writing Mechanics test at Level 5 measures students' growing
understanding of English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing
Mechanics test at Level 5.

Spelling
The student will be able to identify misspellings of commonly used words,
including words with affixes and words that display improper
pluralization.

Capitalization
The student will be able to recognize correct and incorrect capitalization.
Specific rules tested include

- capitalization of proper nouns
- capitalization of the first word of a sentence
- capitalization in titles and forms of address

Punctuation
The student will be able to recognize correct and incorrect punctuation.
Specific rules tested include

- the correct use of the comma
- the correct use of the apostrophe in contractions and possessives
- proper punctuation for dialogue and letter writing
- correct end punctuation

Usage

The student will be able to apply rules of English diction and grammar. Specific rules tested include
- correct pronoun use, including pronoun-antecedent agreement
- correct verb form and tense, including subject-verb agreement and parallelism
- rules of correct and effective expression at the sentence level, including proper modification
- rules of diction within the context of a sentence
- rules of sentence boundaries, including avoiding run-ons and fragments

Writing Concepts and Skills

The CTP 4 Writing Concepts and Skills test at Level 5 integrates students' developing facility with English grammar and usage with a growing understanding of writing and the writing process. As students continue to develop their writing skills and to learn the stages of the writing process, the ability to organize complex information and to recognize the multiple purposes and audiences for writing becomes increasingly important. According to the NCTE/IRA *Standards for the English Language Arts*, it is important that students be able to "employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes" (35).

The following is a list of the skills measured by the CTP 4 Writing Concepts and Skills test at Level 5.

Organization

The student will be able to
- recognize thesis statements, topic sentences, and conclusions
- recognize effective transitions between ideas, sentences, and paragraphs
- effectively and logically sequence information within a paragraph or passage

Purpose, Audience, and Focus

The student will be able to
- recognize the role of the audience within varying contexts and draw logical conclusions about the intended audience for a given passage
- understand how the purpose for and focus of a piece of writing help determine the kind of information included and the appropriate style and tone of the piece

Supporting Details

The student will be able to
- identify effective and relevant details to support a given idea or thesis
- choose the appropriate main idea or topic sentence for a paragraph

Style and Craft

The student will be able to
- recognize and identify accurate and appropriate word choices in a piece of writing
- recognize and identify well-crafted sentences that exhibit rhetorical precision

Mathematics Achievement

The seven content strands in the Level 5 Mathematics Achievement test are 1) Numbers and Number Relationships; 2) Number Systems and Number Theory; 3) Geometry and Spatial Sense; 4) Measurement; 5) Statistics; 6) Probability; and 7) Pre-Algebra. The Number Sense and Operations strands from Levels 1 through 4 are replaced at Level 5 with two new number strands, recognizing the more advanced work at this level in arithmetic and properties of numbers. The Data strand from Levels 1 through 4 has been divided at Level 5 into two strands, reflecting the increased emphasis on statistics and probability. The Patterns strand from Levels 1 through 4 has been replaced with Pre-Algebra, recognizing the move at this level toward more formal algebra. Some topics included in Level 5 but not in Level 4 are

- using expanded notation and exponential forms of numbers
- working with percents
- understanding order of operations
- understanding prime numbers and composite numbers
- understanding least common multiple and greatest common factor
- adding and subtracting fractions with unlike denominators
- understanding congruence and similarity
- identifying lines, line segments, rays and angles
- using coordinate geometry
- finding the range of a set of data
- using Venn diagrams and tree diagrams
- finding probabilities of related events
- formulating equations from word sentences
- applying the concepts of variable, expression, and equation to solve problems

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 5.

Numbers and Number Relationships
The student will be able to
- understand equivalent forms of fractions, decimals, and percents and use number sense for numbers in these forms
- understand multiple representation of numbers, including expanded notation and exponential forms
- apply numbers using multiple representations and understand plotting fractions on a real number line

Number Systems and Number Theory
The student will be able to
- understand place value with whole numbers and decimals and recognize ordering of fractions and decimals
- understand multiples, factors, primes, and composites
- understand order of operations with whole numbers
- apply operations with fractions and decimals and number theory concepts in everyday mathematical situations

Geometry and Spatial Sense

The student will be able to

- use basic geometric language to identify, describe, and name shapes
- understand basic characteristics and properties of figures, including applications in coordinate geometry
- apply geometric properties and relationships, including congruence of figures, lines of symmetry, sum of angle measures in a triangle, images under transformation, and two- and three-dimensional shape changes

Measurement

The student will be able to

- understand systems of measurement and the relationships among units of the same system
- use units appropriately and estimate measures using scale
- understand the measures of figures, including perimeter, circumference, surface area, volume and angles (figures include rectangular solids)
- understand the application of formulas in deriving measures and solve simple rate problems

Statistics

The student will be able to

- read and interpret various types of simple graphs, including bar, single and double line, circle, pictorial, and tables
- understand and compute mean, median, mode, and range

Probability

The student will be able to

- determine probabilities, solve problems of chance using ratios and related probabilities, and make predictions based on mathematical probabilities
- understand counting techniques, including the use of probability to determine amounts

Pre-Algebra

The student will be able to

- represent patterns and mathematical situations involving tables, graphs, and equations
- understand the use of variables, balancing equations, and completing simple mathematical sentences to find an unknown
- apply variables, expressions, and equations to solve real-world problems and formulate equations from word sentences

Math Communication (optional constructed-response section)
The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: solving rate problems, evaluating strategies used to solve a problem, and displaying information that satisfies given constraints.

Quantitative Reasoning

The Quantitative Reasoning test assesses students' ability to engage, in agelevel appropriate ways, in pattern recognition, classification, and reasoning in all content areas including logic, arithmetic, algebra, geometry, probability, and statistics.

The following is a list of the skills measured by the CTP 4 Quantitative Reasoning test at Level 5.

Comparison
The student will be able to
- consider numerical quantities in various forms and compare their sizes
- consider the relative measures of geometric shapes
- recognize relative sizes of units of measure, including between systems

Extensions and Generalizations
The student will be able to
- formulate arithmetic conclusions based on observation and mathematical judgment
- formulate geometric conclusions based on observation and mathematical judgment
- recognize patterns and geometric representation of real-life situations

Analysis
The student will be able to
- interpret symbolic representation of numerical quantities
- evaluate statistical arguments
- model geometric transformations

Level 6

Verbal Reasoning

The CTP 4 Verbal Reasoning test at Level 6 measures students' ability to conceptualize relationships among words and concepts and to draw conclusions based on incomplete information. The ability to infer information that is not explicitly stated in a text is an essential aspect of fluency in reading; the CTP 4 Verbal Reasoning test at Level 6 evaluates students' developing proficiency in this area.

The following is a list of the skills measured by the CTP 4 Verbal Reasoning test at Level 6.

Analogical Reasoning
The student will be able to
- recognize the relationship between two words and identify another pair of words with the same relationship

> Sample Question 1, page 110

- identify the definition that accurately describes the relationship between a pair of words

Categorical Reasoning
The student will be able to
- recognize which of several elements does or does not fit into a thematically grouped list of words

> Sample Question 2, page 110

- generalize about a thematically grouped list of words and choose an appropriate heading for the list

Logical Reasoning
The student will be able to
- solve deductive ordering problems and draw conclusions that are directly deducible from the information provided

> Sample Question 3, page 111

- solve inductive reasoning problems by reasoning from details or evidence to a generalization or hypothesis that makes sense of the evidence

Vocabulary

Reading fluency depends on both an extensive learned vocabulary and the ability to decode unfamiliar words. The CTP 4 Vocabulary test at Level 6 measures students' expanding vocabulary and their developing ability to distinguish more subtle differences among related words. At Level 6, vocabulary words are tested exclusively in the context of a sentence or passage.

The following is a list of the skills measured by the CTP 4 Vocabulary test at Level 6.

Word Meaning

The student will be able to

- understand the meaning of a word in the context of a sentence and identify the correct definition
- understand the meaning of a word in the context of a sentence and identify a synonym for that word
- understand the meaning of a word in the context of a sentence and identify an antonym of that word

Precision

The student will be able to distinguish among subtle shades of meaning in choosing the appropriate word or words to fill in the blank(s) in a sentence.

> Sample Questions 5 and 6, pages 113 and 114

Application

The student will be able to

- understand the meaning of a word in the context of a passage and identify the correct definition of that word
- understand the meaning of a word in the context of a passage and identify a synonym for that word
- understand the meaning of a word in the context of a passage and identify an antonym of that word

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 6 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 6.

Explicit Information

The student will be able to

- use explicit information to identify the main idea or primary purpose of a text or part of a text
- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text

> Sample Questions 1,2,4,6, 7, pages 116-120

- understand connections between and among explicit pieces of information from a passage
- put pieces of information from the passage in the correct chronological order

Inference

The student will be able to
- use implicit information from a passage to make inferences about the motives or behaviors of characters

Sample Question 8, page 121

- use implicit information from a passage to answer specific questions about a text

Analysis

The student will be able to
- determine whether information included in a passage consists of fact or opinion

Sample Question 5, page 118

- use explicit and implicit information to determine the author's likely intent for writing a passage or for including certain information in a passage
- compare and contrast elements in a text
- categorize and combine pieces of information in a text
- synthesize explicit and implicit information to make predictions, draw conclusions, or formulate hypotheses about a text

Sample Questions 3 and 9, pages 117 and 121

Reading for Understanding (optional constructed-response section)

Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 6, most questions require students to make inferences about information that is not explicitly stated in the text. The student will be able to
- describe the main idea of a passage
- describe the overall theme of a passage
- describe a supporting idea in a passage

Sample Question 1, page 122

- compare and contrast elements from two texts

Sample Question 2, page 123

- make inferences about a character's feelings or motivation
- synthesize information from two texts to describe supporting ideas, make predictions, or draw conclusions

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Writing Mechanics

The development of a foundational understanding of language conventions and mechanics is essential as students begin to write more complex texts. The NCTE/IRA *Standards for the English Language Arts* indicates that students should be able to "apply knowledge of language structure and language conventions (e.g., spelling and punctuation) . . . to create, critique, and discuss print and non-print texts" (36). The CTP 4 Writing Mechanics test at Level 6 measures students' growing understanding of English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing Mechanics test at Level 6.

Spelling
The student will be able to identify misspellings of commonly used words, including words with affixes and words that display improper pluralization.

> Sample Question 2, page 124

Capitalization
The student will be able to recognize correct and incorrect capitalization. Specific rules tested include
- capitalization of proper nouns
- capitalization of the first word of a sentence
- capitalization in titles and forms of address

Punctuation
The student will be able to recognize correct and incorrect punctuation. Specific rules tested include

- the correct use of the comma
- the correct use of the apostrophe in contractions and possessives

> Sample Question 1, page 124

- proper punctuation for dialogue and letter writing
- correct end punctuation

Usage
The student will be able to apply rules of English diction and grammar. Specific rules tested include

- correct pronoun use, including pronoun-antecedent agreement
- correct verb form and tense, including subject-verb agreement and parallelism
- rules of correct and effective expression at the sentence level, including proper modification
- rules of diction within the context of a sentence

> Sample Question 3, page 125

- rules of sentence boundaries, including avoiding run-ons and fragments

> Sample Question 4, page 125

Writing Concepts and Skills

The CTP 4 Writing Concepts and Skills test at Level 6 integrates students' developing facility with English grammar and usage with a growing understanding of writing and the writing process. As students continue to develop their writing skills and to learn the stages of the writing process, the ability to organize complex information and to recognize the multiple purposes and audiences for writing becomes increasingly important. According to the NCTE/IRA *Standards for the English Language Arts*, it is important that students be able to "employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes" (35).

The following is a list of the skills measured by the CTP 4 Writing Concepts and Skills test at Level 6.

Organization
The student will be able to
- recognize thesis statements, topic sentences, and conclusions
- recognize effective transitions between ideas, sentences, and paragraphs
- effectively and logically sequence information within a paragraph or passage

Sample Questions 1 and 2, pages 126 and 127

Purpose, Audience, and Focus
The student will be able to
- recognize the role of the audience within varying contexts and draw logical conclusions about the intended audience for a given passage
- understand how the purpose for and focus of a piece of writing help determine the kind of information included and the appropriate style and tone of the piece

Sample Question 3, page 128

Supporting Details
The student will be able to
- identify effective and relevant details to support a given idea or thesis

Sample Question 5, page 129

- choose the appropriate main idea or topic sentence for a paragraph

Sample Question 4, page 128

Style and Craft
The student will be able to
- recognize and identify accurate and appropriate word choices in a piece of writing
- recognize and identify well-crafted sentences that exhibit rhetorical precision

Mathematics Achievement

The seven content strands in the Level 6 Mathematics Achievement test are 1) Numbers and Number Relationships; 2) Number Systems and Number Theory; 3) Geometry and Spatial Sense; 4) Measurement; 5) Statistics; 6) Probability; and 7) Pre-Algebra. Some topics included in Level 6 but not in Level 5 are

- using scientific notation to represent numbers
- understanding similarity of geometric figures
- using the triangle inequality
- understanding the volume and surface area of triangular prisms
- understanding the volume of cylinders

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 6.

Numbers and Number Relationships
The student will be able to
- understand equivalent forms of fractions, decimals, and percents and use number sense for numbers in these forms

> Sample Question 10, page 141

- understand multiple representation of numbers, including expanded notation, exponential forms, and scientific notation
- apply numbers using multiple representations and understand plotting fractions on a real number line

Number Systems and Number Theory
The student will be able to
- understand place value with whole numbers and decimals and recognize ordering of fractions and decimals
- understand multiples, factors, primes, and composites
- understand order of operations with whole numbers
- apply operations with fractions and decimals and number theory concepts in everyday mathematical situations

> Sample Question 4, page 137

Geometry and Spatial Sense
The student will be able to
- use basic geometric language to identify, describe, and name shapes

> Sample Question 8, page 140

- understand basic characteristics and properties of figures, including applications in coordinate geometry

> Sample Question 3, page 136

- apply geometric properties and relationships, including congruence of figures, lines of symmetry, sum of angle measures in a triangle, triangle inequality, images under transformation, and two- and three-dimensional shape changes

Measurement
The student will be able to
- understand systems of measurement and the relationships among units of the same system
- use units appropriately and estimate measures using scale
- understand the measures of figures, including perimeter, circumference, surface area, volume, and angles (figures include rectangular and triangular solids)

> Sample Questions 5, 7, 9, pages 137-140

- understand the application of formulas in deriving measures and solve simple rate problems

Statistics
The student will be able to
- read and interpret various types of simple graphs, including bar, single and double line, circle, pictorial, and tables
- understand and compute mean, median, mode, and range

> Sample Questions 1 and 2, pages 134 and 135

Probability
The student will be able to
- determine probabilities, solve problems of chance using ratios and related probabilities, and make predictions based on mathematical probabilities

> Sample Question 6, page 138

- understand counting techniques, including the use of probability to determine amounts

Pre-Algebra
The student will be able to
- represent patterns and mathematical situations involving tables, graphs, and equations
- understand the use of variables, balancing equations, and completing simple mathematical sentences to find an unknown
- apply variables, expressions, and equations to solve real-world problems and formulate equations from word sentences

Math Communication (optional constructed-response section)
The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: using mathematical argument to support a conclusion, representing percents in a circle graph, and supplying an example to demonstrate a statistical problem.

> Sample Questions 1 and 2, pages 142 and 143

Quantitative Reasoning

The Quantitative Reasoning test assesses students' ability to engage, in age-level appropriate ways, in pattern recognition, classification, and reasoning in all content areas including logic, arithmetic, algebra, geometry, probability, and statistics.

The following is a list of the skills measured by the CTP 4 Quantitative Reasoning test at Level 6.

Comparison
The student will be able to
- consider numerical quantities in various forms and compare their sizes
- consider the relative measures of geometric shapes

Sample Question 1, page 130

- recognize relative sizes of units of measure, including between systems

Extensions and Generalizations
The student will be able to
- formulate arithmetic conclusions based on observation and mathematical judgment

Sample Question 2, page 131

- formulate geometric conclusions based on observation and mathematical judgment
- recognize patterns and geometric representation of real-life situations

Analysis
The student will be able to
- interpret symbolic representation of numerical quantities

Sample Question 3, page 132

- evaluate statistical arguments
- model geometric transformations

Sample Question 4, page 133

Level 7

Verbal Reasoning

The CTP 4 Verbal Reasoning test at Level 7 measures students' ability to conceptualize relationships among words and concepts and to draw conclusions based on incomplete information. The ability to infer information that is not explicitly stated in a text is an essential aspect of fluency in reading; the CTP 4 Verbal Reasoning test at Level 7 evaluates students' developing proficiency in this area.

The following is a list of the skills measured by the CTP 4 Verbal Reasoning test at Level 7.

Analogical Reasoning
The student will be able to
- recognize the relationship between two words and identify another pair of words with the same relationship
- identify the definition that accurately describes the relationship between a pair of words

Categorical Reasoning
The student will be able to
- recognize which of several elements does or does not fit into a thematically grouped list of words
- generalize about a thematically grouped list of words and choose an appropriate heading for the list

Logical Reasoning
The student will be able to
- solve deductive ordering problems and draw conclusions that are directly deducible from the information provided
- solve inductive reasoning problems by reasoning from details or evidence to a generalization or hypothesis that makes sense of the evidence

Vocabulary

Reading fluency depends on both an extensive learned vocabulary and the ability to decode unfamiliar words. The CTP 4 Vocabulary test at Level 7 measures students' expanding vocabulary and their developing ability to distinguish more subtle differences among related words. At Level 7, vocabulary words are tested both in and out of context.

The following is a list of the skills measured by the CTP 4 Vocabulary test at Level 7.

Word Meaning
The student will be able to
- identify a synonym for a word, either in the context of a sentence or alone
- identify an antonym of a word, either in the context of a sentence or alone

Precision

The student will be able to distinguish among subtle shades of meaning in choosing the appropriate word or words to fill in the blank(s) in a sentence.

Application

The student will be able to
- understand the meaning of a word in the context of a passage and identify the correct definition of that word
- understand the meaning of a word in the context of a passage and identify a synonym for that word

Sample Questions 1-4, pages 111-113

- understand the meaning of a word in the context of a passage and identify an antonym of that word

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 7 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 7.

Explicit Information

The student will be able to
- use explicit information to identify the main idea or primary purpose of a text or part of a text
- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text
- understand connections between and among explicit pieces of information from a passage
- put pieces of information from the passage in the correct chronological order

Inference

The student will be able to
- use implicit information from a passage to make inferences about the motives or behaviors of characters
- use implicit information from a passage to answer specific questions about a text

Analysis

The student will be able to
- determine whether information included in a passage consists of fact or opinion
- use explicit and implicit information to determine the author's likely intent for writing a passage or for including certain information in a passage
- compare and contrast elements in a text

- categorize and combine pieces of information in a text
- synthesize explicit and implicit information to make predictions, draw conclusions, or formulate hypotheses about a text

Reading for Understanding (optional constructed-response section)
Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 7, most questions require students to make inferences about information that is not explicitly stated in the text. The student will be able to

- describe the main idea of a passage
- describe the overall theme of a passage
- describe a supporting idea in a passage
- compare and contrast elements from two texts
- make inferences about a character's feelings or motivation
- make inferences about the author's purpose
- synthesize information from two texts to describe supporting ideas, make predictions, or draw conclusions

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Writing Mechanics

The development of an increasingly sophisticated understanding of language conventions and mechanics is essential as students continue to write more and more complex texts. The NCTE/IRA *Standards for the English Language Arts* indicates that students should be able to "apply knowledge of language structure and language conventions (e.g., spelling and punctuation) . . . to create, critique, and discuss print and non-print texts" (36). The CTP 4 Writing Mechanics test at Level 7 measures students' growing facility with English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing Mechanics test at Level 7.

Spelling, Capitalization, and Punctuation
The student will be able to recognize spelling, capitalization, and punctuation errors. Specific elements tested include
- spelling of commonly used words, including words with affixes and words that display improper pluralization
- capitalization of proper nouns
- capitalization in titles and forms of address
- the correct use of the comma, semicolon, and colon
- the correct use of the apostrophe in contractions and possessives
- proper punctuation for dialogue and letter writing
- correct end punctuation

Usage

The student will be able to apply rules of English diction and grammar. Specific rules tested include
- correct pronoun use, including pronoun-antecedent agreement
- correct verb form and tense, including subject-verb agreement and parallelism
- rules of correct and effective expression at the sentence level, including proper modification
- rules of diction within the context of a sentence

Sentence Construction

The student will be able to apply rules regarding sentence boundaries, including recognizing run-on sentences and sentence fragments.

Writing Concepts and Skills

The CTP 4 Writing Concepts and Skills test at Level 7 integrates students' developing facility with English grammar and usage with a growing understanding of writing and the writing process. As students continue to develop their writing skills and to learn the stages of the writing process, the ability to organize complex information and to recognize the multiple purposes and audiences for writing becomes increasingly important. According to the NCTE/IRA *Standards for the English Language Arts*, it is important that students be able to "employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes" (35).

The following is a list of the skills measured by the CTP 4 Writing Concepts and Skills test at Level 7.

Organization

The student will be able to
- recognize thesis statements, topic sentences, and conclusions
- recognize effective transitions between ideas, sentences, and paragraphs
- effectively and logically sequence information within a paragraph or passage

Purpose, Audience, and Focus

The student will be able to
- recognize the role of the audience within varying contexts and draw logical conclusions about the intended audience for a given passage
- understand how the purpose for and focus of a piece of writing help determine the kind of information included and the appropriate style and tone of the piece

Supporting Details

The student will be able to
- identify effective and relevant details to support a given idea or thesis
- choose the appropriate main idea or topic sentence for a paragraph

Style and Craft

The student will be able to
- recognize and identify accurate and appropriate word choices in a piece of writing

- effectively combine two or more sentences into one logical sentence
- recognize and identify well-crafted sentences that exhibit rhetorical precision

Mathematics Achievement

The content strands in the Level 7 Mathematics Achievement test are 1) Numbers and Number Relationships; 2) Number Systems and Number Theory; 3) Geometry; 4) Measurement; 5) Probability; 6) Statistics; and 7) Pre-Algebra. Some topics included in Level 7 but not in Level 6 are
- representing numbers in one- and two-dimensional graphs
- estimating square roots
- applying theories of whole numbers, and signed numbers in context
- using the Pythagorean Theorem
- computing perimeter and area of irregular figures
- solving linear equations and inequalities

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 7.

Numbers and Number Relationships
The student will be able to
- understand equivalent forms of fractions, decimals, and percents; use estimates of these numbers and square roots; and use multiple representation of numbers, including exponential and scientific notations
- recognize the form of a number appropriate for use in a given situation and apply ratio, percent, and proportion in a variety of situations
- represent number relationships in one- and two-dimensional graphs

Number Systems and Number Theory
The student will be able to
- recognize the need for numbers beyond whole numbers, including signed numbers, decimals, and fractions
- identify perfect squares, factors, or multiples of integers, including least common multiple and greatest common divisor
- apply operations with fractions, decimals, and signed numbers and number theory concepts in everyday mathematical situations
- understand order of arithmetic operations

Geometry and Spatial Sense
The student will be able to
- use basic geometric language to classify and characterize properties of geometric figures
- apply geometric properties and relationships to two- and three-dimensional figures, including the Pythagorean Theorem, congruence and similarity of figures, lines of symmetry, sum of angle measures in a triangle, triangle inequality, and transformation in the coordinate plane

Measurement

The student will be able to

- apply concepts of measure, including perimeter, circumference, surface area, volume, weight, and angle measure (figures include irregular shapes)
- use units appropriately and estimate measures using scale
- develop formulas to solve problems of measure and solve simple rate problems

Probability

The student will be able to

- determine probabilities, solve problems of chance using ratios and related probabilities, and make predictions based on mathematical probabilities
- understand counting techniques, including the use of permutations and combinations

Statistics

The student will be able to

- generate, organize, evaluate, and interpret various data representations
- understand and compute mean, median, mode, and range

Pre-Algebra

The student will be able to

- represent patterns and mathematical situations involving tables, graphs, verbal rules, and equations
- solve simple linear equations and inequalities
- apply variables, expressions, and equations to solve real-world problems and mathematical problems

Math Communication (optional constructed-response section)
The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: showing application of the Pythagorean Theorem to solve a problem, placing fractions and decimals on a number line, and expressing a relationship algebraically.

Quantitative Reasoning

The Quantitative Reasoning test assesses students' ability to engage, in age-level appropriate ways, in pattern recognition, classification, and reasoning in all content areas including logic, arithmetic, algebra, geometry, probability, and statistics.

The following is a list of the skills measured by the CTP 4 Quantitative Reasoning test at Level 7.

Comparison

The student will be able to

- consider numerical quantities in various forms and compare their sizes
- consider the relative measures of geometric shapes

Extensions and Generalizations

The student will be able to

- formulate arithmetic conclusions based on observation and mathematical judgment
- formulate geometric conclusions based on observation and mathematical judgment
- recognize patterns, logic problems, and geometric representation of reallife situations

Analysis

The student will be able to

- interpret algebraic representations
- evaluate statistical arguments, including counting principles and basic interpretation of probabilities
- model geometric transformations

Level 8

Verbal Reasoning

The CTP 4 Verbal Reasoning test at Level 8 measures students' ability to conceptualize relationships among words and concepts and to draw conclusions based on incomplete information. The ability to infer information that is not explicitly stated in a text is an essential aspect of fluency in reading; the CTP 4 Verbal Reasoning test at Level 8 evaluates students' developing proficiency in this area.

The following is a list of the skills measured by the CTP 4 Verbal Reasoning test at Level 8.

Analogical Reasoning
The student will be able to
- recognize the relationship between two words and identify another pair of words with the same relationship

> Sample Question 1, page 144

- identify the definition that accurately describes the relationship between a pair of words

Categorical Reasoning
The student will be able to
- recognize which of several elements does or does not fit into a thematically grouped list of words

> Sample Question 2, page 144

- generalize about a thematically grouped list of words and choose an appropriate heading for the list

Logical Reasoning
The student will be able to
- solve deductive ordering problems and draw conclusions that are directly deducible from the information provided

> Sample Question 3, page 145

- solve inductive reasoning problems by reasoning from details or evidence to a generalization or hypothesis that makes sense of the evidence

Vocabulary

Reading fluency depends on both an extensive learned vocabulary and the ability to decode unfamiliar words. The CTP 4 Vocabulary test at Level 8 measures students' expanding vocabulary and their developing ability to distinguish more subtle differences among related words. At Level 8, vocabulary words are tested both in and out of context.

The following is a list of the skills measured by the CTP 4 Vocabulary test at Level 8.

Word Meaning
The student will be able to identify synonyms and antonyms of words

Precision
The student will be able to distinguish among subtle shades of meaning in choosing the appropriate word or words to fill in the blank(s) in a sentence.

Sample Questions 2 and 3, page 146

Application
The student will be able to
- identify the correct definition of a word in the context of a passage

Sample Question 1, page 145

- identify a synonym or antonym of a word in the context of a passage

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 8 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 8.

Explicit Information
The student will be able to
- use explicit information to identify the main idea or primary purpose of a text or part of a text
- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text
- understand connections between and among explicit pieces of information from a passage
- put pieces of information from the passage in correct chronological order

Inference
The student will be able to
- use implicit information from a passage to make inferences about the motives or behaviors of characters
- use implicit information from a passage to answer specific questions about a text

Analysis
The student will be able to
- determine whether information included in a passage consists of fact or opinion
- use explicit and implicit information to determine the author's likely intent for writing a passage or for including certain information in a passage
- synthesize explicit and implicit information to make predictions, draw conclusions, or formulate hypotheses about a text

Reading for Understanding (optional constructed-response section)
Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 8, most questions require students to make inferences about information that is not explicitly stated in the text. The student will be able to

- describe the main idea or overall theme of a passage and/or summarize the main points of a passage
- describe a supporting idea in a passage

Sample Question 1, page 156

- compare and contrast elements from two texts
- make inferences about a character's motivation or the author's purpose
- synthesize information from two texts to describe supporting ideas, make predictions, or draw conclusions

Sample Question 2, page 158

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Writing Mechanics

The development of an increasingly sophisticated understanding of language conventions and mechanics is essential as students continue to write more and more complex texts. The NCTE/IRA *Standards for the English Language Arts* indicates that students should be able to "apply knowledge of language structure and language conventions (e.g., spelling and punctuation) . . . to create, critique, and discuss print and non-print texts" (36). The CTP 4 Writing Mechanics test at Level 8 measures students' growing facility with English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing Mechanics test at Level 8.

Spelling, Capitalization, and Punctuation
The student will be able to recognize spelling, capitalization, and punctuation errors. Specific elements tested include

- spelling of commonly used words, including words with affixes and words that display improper pluralization

Sample Question 2, page 159

- capitalization of proper nouns and in titles and forms of address
- the correct use of the comma, semicolon, and colon

Sample Question 1, page 159

- the correct use of the apostrophe in contractions and possessives
- proper punctuation for dialogue and quotations
- correct end punctuation

Usage
The student will be able to apply rules of English diction and grammar. Specific rules tested include
- correct pronoun use, including pronoun-antecedent agreement
- correct verb form and tense, including subject-verb agreement and parallelism
- rules of correct and effective expression at the sentence level, including proper modification
- rules of diction within the context of a sentence

<div style="text-align:center; border:1px solid;">Sample Question 3, page 160</div>

Sentence Construction
The student will be able to apply rules regarding sentence boundaries, including recognizing run-on sentences and sentence fragments.

Writing Concepts and Skills

The CTP 4 Writing Concepts and Skills test at Level 8 integrates students' developing facility with English grammar and usage with an increasingly sophisticated understanding of the writing process. As students continue to develop their writing skills, the ability to organize complex information and to recognize the multiple purposes and audiences for writing becomes increasingly important. According to the NCTE/IRA *Standards for the English Language Arts*, it is important that students be able to "employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes" (35).

The following is a list of the skills measured by the CTP 4 Writing Concepts and Skills test at Level 8.

Organization
The student will be able to
- recognize thesis statements, topic sentences, and conclusions
- recognize effective transitions between ideas, sentences, and paragraphs
- effectively and logically sequence information

<div style="text-align:center; border:1px solid;">Sample Questions 2 and 3, pages 161 and 162</div>

Purpose, Audience, and Focus
The student will be able to
- recognize the role of the audience within varying contexts and draw logical conclusions about the intended audience for a given passage
- understand how the purpose for and focus of a piece of writing help determine the kind of information included and the appropriate style and tone of the piece

<div style="text-align:center; border:1px solid;">Sample Question 1, page 161</div>

Supporting Details

The student will be able to

- identify effective and relevant details to support a given idea or thesis
- choose the appropriate main idea or topic sentence for a paragraph

Style and Craft

The student will be able to

- recognize and identify accurate and appropriate word choices in a piece of writing
- effectively combine two or more sentences into one logical sentence
- recognize and identify well-crafted sentences that exhibit rhetorical precision

Mathematics Achievement

The seven content strands in the Level 8 Mathematics Achievement test are 1) Numbers and Number Relationships; 2) Number Systems and Number Theory; 3) Geometry; 4) Measurement; 5) Probability; 6) Statistics; and 7) Pre-Algebra. At Level 8 there is an increased emphasis on questions in Pre-Algebra. Additionally, some topics included in Level 8 but not in Level 7 are

- using properties of three-dimensional figures
- computing volume and surface area of irregular three-dimensional figures
- graphing lines in the coordinate plane
- simplifying simple algebraic expressions

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 8.

Numbers and Number Relationships

The student will be able to

- understand equivalent forms of fractions, decimals, and percents; use estimates of these numbers and square roots; and use multiple representation of numbers including exponential and scientific notations

- recognize the form of a number appropriate for use in a given situation and apply ratio, percent, and proportion in a variety of situations

- represent number relationships in one- and two-dimensional graphs

Number Systems and Number Theory

The student will be able to
- recognize the need for numbers beyond whole numbers, including signed numbers, decimals, and fractions
- identify perfect squares, factors, or multiples of integers, including least common multiple and greatest common divisor
- apply operations with fractions, decimals, and signed numbers and number theory concepts in everyday mathematical situations
- understand order of arithmetic operations

Geometry and Spatial Sense

The student will be able to
- use basic geometric language to classify and characterize properties of geometric figures including three-dimensional figures
- apply geometric properties and relationships to two- and three-dimensional figures including the Pythagorean Theorem, congruence and similarity of figures, lines of symmetry, sum of angle measures in a polygon, triangle inequality, and transformation in the coordinate plane

Measurement

The student will be able to
- apply concepts of measure including perimeter, circumference, surface area, volume, weight and angle measure (figures include irregular shapes)
- use units appropriately, including units in the metric system, and estimate measures using scale
- develop formulas to solve problems of measure and simple rate problems

Probability

The student will be able to
- determine probabilities, solve problems of chance using ratios and related probabilities and make predictions based on mathematical probabilities

- understand counting techniques including use of permutations and combinations

Statistics

The student will be able to
- generate, organize, evaluate and interpret various data representations
- understand and compute mean, median, mode and range

Pre-Algebra

The student will be able to
- represent patterns and mathematical situations involving tables, graphs, verbal rules and equations

- solve linear equations and inequalities, simplify algebraic expression and graph linear equations and inequalities on a number line or in the coordinate plane

<div style="text-align:center;">

Sample Question 9, page 174

</div>

- apply variables, expressions and equations to solve real-world problems and mathematical problems including simple non-linear equations

<div style="text-align:center;">

Sample Questions 5 and 6, pages 170 and 171

</div>

Math Communication (optional constructed-response section)
The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: drawing a three-dimensional solid resulting from a transformation, citing a counterexample to disprove a statement, and writing a linear equation from information given about the line.

<div style="text-align:center;">

Sample Questions 1 and 2, pages 175 and 176

</div>

Quantitative Reasoning

The Quantitative Reasoning test assesses students' ability to engage, in age-level appropriate ways, in pattern recognition, classification, and reasoning in all content areas, including logic, arithmetic, algebra, geometry, probability, and statistics.

The following is a list of the skills measured by the CTP 4 Quantitative Reasoning test at Level 8.

Comparison
The student will be able to
- consider numerical quantities in various forms and compare their sizes
- consider the relative measures of geometric shapes
- recognize relative sizes of units of measure, including between systems

Extensions and Generalizations
The student will be able to
- formulate arithmetic conclusions based on observation and mathematical judgment

<div style="text-align:center;">

Sample Question 2, page 166

</div>

- formulate geometric conclusions based on observation and mathematical judgment
- recognize patterns, logic problems, and geometric representation of reallife situations

Analysis
The student will be able to
- interpret algebraic representations

<div style="text-align:center;">

Sample Questions 1 and 3, pages 165 and 167

</div>

- evaluate statistical arguments, including counting principles and basic interpretation of probabilities

Algebra I

The Algebra I test is an end-of-course test and should be administered at the completion of a first-year course in Algebra. The four content strands in the Algebra I test are 1) Expressions, Statements, and Matrices; 2) Equations and Inequalities; 3) Tables, Graphs, and Algebraic Geometry; and 4) Situations Involving Variable Quantities.

The following is a list of the skills measured by the CTP 4 Algebra I test at Level 8.

Expressions, Statements, and Matrices
The student will be able to
- simplify algebraic expressions in various forms by applying arithmetic properties (forms include rational and exponential expressions)
- understand equivalent algebraic expressions, including expressions that are obtained by factoring
- evaluate algebraic expressions for given values

Equations and Inequalities
The student will be able to
- solve linear equations/inequalities, simple systems of linear equations, and literal equations for one variable

> Sample Questions 2 and 5 pages 177 and 180

- identify arithmetic properties
- apply algebraic equations to solve real-life problems and mathematical situations
- solve simple quadratic equations

> Sample Question 1, page 177

- understand relationships of coefficients for equivalent quadratic expressions

Tables, Graphs, and Algebraic Geometry
The student will be able to
- understand the xy-coordinate system and graphs of points, linear equations, and linear inequalities

> Sample Question 3, page 178

- identify linear equations and their characteristics, including slope and x- and y-intercepts
- recognize relationships between parallel and perpendicular lines

Situations Involving Variable Quantities
The student will be able to translate real-life and mathematical situations into algebraic expressions or equations.

> Sample Question 4, page 179

Level 9

Verbal Reasoning

The CTP 4 Verbal Reasoning test at Level 9 measures students' ability to conceptualize relationships among words and concepts and to draw conclusions based on incomplete information. The ability to infer information that is not explicitly stated in a text is an essential aspect of fluency in reading; the CTP 4 Verbal Reasoning test at Level 9 evaluates students' developing proficiency in this area.

The following is a list of the skills measured by the CTP 4 Verbal Reasoning test at Level 9.

Analogical Reasoning
The student will be able to
- recognize the relationship between two words and identify another pair of words with the same relationship
- identify the definition that accurately describes the relationship between a pair of words

Categorical Reasoning
The student will be able to
- recognize which of several elements does or does not fit into a thematically grouped list of words
- generalize about a thematically grouped list of words and choose an appropriate heading for the list

Logical Reasoning
The student will be able to
- solve deductive ordering problems and draw conclusions that are directly deducible from the information provided
- solve inductive reasoning problems by reasoning from details or evidence to a generalization or hypothesis that makes sense of the evidence

Vocabulary

Reading fluency depends on both an extensive learned vocabulary and the ability to decode unfamiliar words. The CTP 4 Vocabulary test at Level 9 measures students' expanding vocabulary and their developing ability to distinguish more subtle differences among related words. At Level 9, vocabulary words are tested both in and out of context.

The following is a list of the skills measured by the CTP 4 Vocabulary test at Level 9.

Word Meaning
The student will be able to identify synonyms and antonyms of words.

Precision
The student will be able to distinguish among subtle shades of meaning in choosing the appropriate word or words to fill in the blank(s) in a sentence.

Application

The student will be able to

- understand the meaning of a word in the context of a passage and identify the correct definition of that word
- understand the meaning of a word in the context of a passage and identify a synonym for that word
- understand the meaning of a word in the context of a passage and identify an antonym of that word

Reading Comprehension

The CTP 4 Reading Comprehension test at Level 9 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 9.

Explicit Information

The student will be able to

- use explicit information to identify the main idea or primary purpose of a text or part of a text

> Sample Question 1, page 147

- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text

> Sample Question 7, page 152

- understand connections between and among explicit pieces of information from a passage

Inference

The student will be able to

- use implicit information from a passage to make inferences about the motives or behaviors of characters
- use implicit information from a passage to draw conclusions about a text

> Sample Questions 4,8,9,10, pages 149-153

Analysis

The student will be able to

- determine whether information included in a passage consists of fact or opinion
- use explicit and implicit information to determine the author's likely intent for writing a passage or for including certain information in a passage

> Sample Questions 3,5,6,11 pages 148-154

- compare and contrast elements in a text
- categorize and combine pieces of information in a text
- synthesize explicit and implicit information to make predictions, draw conclusions, or formulate hypotheses about a text
- identify the style, tone, or theme of a text

> Sample Question 2, page 148

Reading for Understanding (optional constructed-response section) Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 9, most questions require students to make inferences about information that is not explicitly stated in the text. At this level, students are also asked to apply their growing understanding of figurative language to answer some questions. The student will be able to

- describe the main idea of a passage and/or summarize the main points of a passage
- describe the overall theme of a passage
- describe a supporting idea in a passage
- apply understanding of figurative language to describe aspects of a passage
- compare and contrast elements from two texts
- make inferences about a character's motivation or the author's purpose
- synthesize information from two texts to describe supporting ideas, make predictions, or draw conclusions

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Writing Mechanics

The development of an increasingly sophisticated understanding of language conventions and mechanics is essential as students continue to write more and more complex texts. The NCTE/IRA *Standards for the English Language Arts* indicates that students should be able to "apply knowledge of language structure and language conventions (e.g., spelling and punctuation) … to create, critique, and discuss print and non-print texts" (36). The CTP 4 Writing Mechanics test at Level 9 measures students' growing facility with English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing Mechanics test at Level 9.

Spelling, Capitalization, and Punctuation
The student will be able to recognize spelling, capitalization, and punctuation errors. Specific elements tested include
- spelling of commonly used words

- capitalization of proper nouns
- capitalization in titles and forms of address
- the correct use of the comma, semicolon, and colon
- the correct use of the apostrophe in contractions and possessives
- proper punctuation for dialogue and quotations
- correct end punctuation

Usage
The student will be able to apply rules of English diction and grammar. Specific rules tested include
- correct pronoun use, including pronoun-antecedent agreement
- correct verb form and tense, including subject-verb agreement and parallelism
- rules of correct and effective expression at the sentence level, including proper modification
- rules of diction within the context of a sentence
- rules regarding sentence boundaries, including avoiding run-ons and fragments and recognizing sentence types

Writing Concepts and Skills

The CTP 4 Writing Concepts and Skills test at Level 9 integrates students' developing facility with English grammar and usage with an increasingly sophisticated understanding of the writing process. As students continue to develop their writing skills, the ability to organize complex information and to recognize the multiple purposes and audiences for writing becomes increasingly important. According to the NCTE/IRA *Standards for the English Language Arts*, it is important that students be able to "employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes" (35).

The following is a list of the skills measured by the CTP 4 Writing Concepts and Skills test at Level 9.

Organization
The student will be able to
- recognize thesis statements, topic sentences, and conclusions
- recognize effective transitions between ideas, sentences, and paragraphs
- recognize effective and logical organization and organizational strategies

Purpose, Audience, and Focus
The student will be able to
- recognize the role of the audience within varying contexts and draw logical conclusions about the intended audience for a given passage
- understand how the purpose for and focus of a piece of writing help determine the kind of information included and the appropriate style and tone of the piece

Supporting Details
The student will be able to
- draw conclusions based on supporting details in a passage
- determine the stated or implied purpose of supporting details within the context of a passage

- make judgments about the relative importance of supporting details to the passage as a whole

Style and Craft
The student will be able to
- identify rhetorical features that contribute to the overall precision and style of a piece of writing
- identify the author's tone or voice in a piece of writing

Mathematics Achievement

The four content strands in the Level 9 mathematics achievement test are 1) Numbers and Number Relationships; 2) Geometry and Spatial Sense; 3) Data Analysis, Probability, and Statistics; and 4) Algebra. Level 9 is the first level that has an Algebra content strand, and the number of questions in Geometry at this level is significantly greater than the number at any prior level. Additionally, topics included in Level 9 but not in Level 8 are
- applying the different forms of real numbers, including radicals, in a variety of situations
- performing operations with different forms of real numbers
- understanding properties of quadrilaterals, triangles, and circles and applying basic theorems related to them
- solving a literal equation for a variable
- applying variables, expressions, and equations to solve problems
- understanding the concepts of slope and x- and y-intercepts, and applying these concepts to finding the equation of a line, making predictions, and to solving rate problems

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 9.

Numbers and Number Relationships
The student will be able to
- understand different forms of real numbers and the relationships between them including fractions, decimals, percents, and exponential and scientific notation
- understand properties of operations and perform operations with different forms of real numbers
- apply different forms of real numbers in a variety of situations (forms include radicals)
- apply theories of whole numbers in a variety of situations

Geometry and Spatial Sense
The student will be able to
- use basic geometric language to classify and characterize properties of geometric figures, including quadrilaterals, triangles, circles, and three-dimensional figures
- apply geometric properties and relationships to two- and three-dimensional figures, including the Pythagorean Theorem, sum of angle measures in a polygon, and triangle inequality; develop formulas to

solve geometric problems; and use number line and coordinate geometry
- apply concepts of measure, including perimeter, circumference, surface area, volume, weight, angle measure, distance, and slope as they relate to parallel or perpendicular lines
- apply concepts of congruence, similarity, and simple transformation

Data Analysis, Statistics, and Probability
The student will be able to
- generate, organize, evaluate, and interpret various data representations, including graphs, charts, and histograms
- understand counting techniques for solving problems, including the use of permutations and combinations; understand and compute mean, median, mode, and range; and make conjectures and inferences from data provided
- determine probabilities, solve problems of chance using ratios and related probabilities, and make predictions based on mathematical probabilities

Algebra
The student will be able to
- represent patterns and mathematical situations using tables, graphs, verbal rules, and equations
- understand properties of operations, including commutative and associative, and simplify algebraic expressions
- solve linear equations and inequalities in one variable and solve literal equations for a variable
- apply variables, expressions, and equations to solve real-world problems and mathematical problems including nonlinear equations
- understand slope and *x*- and *y*-intercepts and apply these concepts to find an equation of a line, make predictions, and solve rate problems

Math Communication (optional constructed-response section)
The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: showing the solution of a system of equations, explaining properties of parallel lines used to find angle measures, and using formulas to compute geometric measures.

Quantitative Reasoning

The Quantitative Reasoning test assesses students' ability to engage, in age-level appropriate ways, in pattern recognition, classification, and reasoning in all content areas, including logic, arithmetic, algebra, geometry, probability, and statistics.

The following is a list of the skills measured by the CTP 4 Quantitative Reasoning test at Level 9.

Comparison
The student will be able to
- consider numerical quantities in various forms and compare their sizes
- consider the relative measures of geometric shapes

Extensions and Generalizations
The student will be able to

- formulate arithmetic conclusions based on observation and mathematical judgment
- formulate geometric conclusions based on observation and mathematical judgment
- recognize patterns, logic problems, and geometric representation of reallife situations

Analysis

The student will be able to
- interpret algebraic representations, including those in real-life situations
- interpret geometric representations, including applying properties in coordinate geometry
- evaluate statistical arguments, including counting principles, measures of central tendency, and interpretation of probabilities

Algebra I

The Algebra I test is an end-of-course test and should be administered at the completion of a first-year course in Algebra. The four content strands in the Algebra I test are 1) Expressions, Statements, and Matrices; 2) Equations and Inequalities; 3) Tables, Graphs, and Algebraic Geometry; and 4) Situations Involving Variable Quantities.

The following is a list of the skills measured by the CTP 4 Algebra I test at Level 9.

Expressions, Statements, and Matrices

The student will be able to
- simplify algebraic expressions in various forms by applying arithmetic properties; forms include rational and exponential expressions
- understand equivalent algebraic expressions, including expressions that are obtained by factoring
- evaluate algebraic expressions for given values

Equations and Inequalities

The student will be able to
- solve linear equations/inequalities, simple systems of linear equations, and literal equations for one variable
- identify arithmetic properties
- apply algebraic equations to solve real-life problems and mathematical situations
- solve simple quadratic equations
- understand relationships of coefficients for equivalent quadratic expressions

Tables, Graphs, and Algebraic Geometry

The student will be able to
- understand the xy-coordinate system and graphs of points, linear equations, and linear inequalities
- identify linear equations and their characteristics, including slope and x- and y-intercepts
- recognize relationships between parallel and perpendicular lines

Situations Involving Variable Quantities

The student will be able to translate real-life and mathematical situations

into algebraic expressions or equations.

Level 10

Verbal Reasoning

The CTP 4 Verbal Reasoning test at Level 10 measures students' ability to conceptualize relationships among words and concepts and to draw conclusions based on incomplete information. The ability to infer information that is not explicitly stated in a text is an essential aspect of fluency in reading; the CTP 4 Verbal Reasoning test at Level 10 evaluates students' developing proficiency in this area.

The following is a list of the skills measured by the CTP 4 Verbal Reasoning test at Level 10.

Analogical Reasoning
The student will be able to
- recognize the relationship between two words and identify another pair of words with the same relationship
- identify the definition that accurately describes the relationship between a pair of words

Categorical Reasoning
The student will be able to
- recognize which of several elements does or does not fit into a thematically grouped list of words
- generalize about a thematically grouped list of words and choose an appropriate heading for the list

Logical Reasoning
The student will be able to
- solve deductive ordering problems and draw conclusions that are directly deducible from the information provided
- solve inductive reasoning problems by reasoning from details or evidence to a generalization or hypothesis that makes sense of the evidence

Vocabulary

Reading fluency depends on both an extensive learned vocabulary and the ability to decode unfamiliar words. The CTP 4 Vocabulary test at Level 10 measures students' expanding vocabulary and their developing ability to distinguish more subtle differences among related words. At Level 10, vocabulary words are tested both in and out of context.

The following is a list of the skills measured by the CTP 4 Vocabulary test at Level 10.

Word Meaning
The student will be able to identify synonyms and antonyms of words.

Precision
The student will be able to distinguish among subtle shades of meaning in choosing the appropriate word or words to fill in the blank(s) in a sentence.

Application

The student will be able to
- identify the correct definition of a word in the context of a passage
- identify a synonym or antonym of a word in the context of a passage

Reading Comprehension
The CTP 4 Reading Comprehension test at Level 10 measures students' ability to understand and interpret written text. The NCTE/IRA *Standards for the English Language Arts* emphasizes the importance of being able to use a "wide range of strategies to comprehend, interpret, evaluate, and appreciate text" (31). The CTP 4 Reading Comprehension test requires students to draw on these strategies to interpret and analyze a range of texts, both fiction and nonfiction.

The following is a list of the skills measured by the CTP 4 Reading Comprehension test at Level 10.

Explicit Information
The student will be able to
- use explicit information to identify the main idea or primary purpose of a text or part of a text
- identify explicit details from a passage and provide answers to "who," "what," "where," "when," "why," and "how" questions about the text
- understand connections between and among explicit pieces of information from a passage
- put pieces of information from the passage in correct chronological order

Inference
The student will be able to
- use implicit information from a passage to make inferences about the motives or behaviors of characters
- use implicit information from a passage to answer specific questions about a text

Analysis
The student will be able to
- determine whether information included in a passage consists of fact or opinion
- use explicit and implicit information to determine the author's likely intent for writing a passage or for including certain information in a passage
- compare and contrast elements in a text
- categorize and combine pieces of information in a text
- synthesize explicit and implicit information to make predictions, draw conclusions, or formulate hypotheses about a text
- identify the style, tone, or theme of a text

Reading for Understanding (optional constructed-response section)
Students use their developing productive language skills to answer questions about text, employing comprehension strategies to interpret and analyze the texts, describe important aspects of the texts, synthesize information from two texts, and compare and contrast elements within a text and/or between two texts. At level 10, most questions require students to make inferences about information that is not explicitly stated in the text. At this level, students are also asked to apply their growing understanding of figurative language to answer some questions. The

student will be able to

- describe the main idea or overall theme of a passage and/or summarize the main points of a passage
- describe a supporting idea in a passage
- apply understanding of figurative language to describe aspects of a passage
- compare and contrast elements from two texts
- make inferences about a character's feelings or motivation
- make inferences about the author's purpose
- synthesize information from two texts to describe supporting ideas, make predictions, or draw conclusions

Note: Although the Reading for Understanding section does require students to write their answers, it is a test of reading comprehension and not writing ability. Students' responses are evaluated based on how completely and thoroughly they answer the questions; misspellings, grammatical mistakes, and other writing errors do not count against them. The questions are scored on a 0-2 scale.

Writing Mechanics

The development of an increasingly sophisticated understanding of language conventions and mechanics is essential as students continue to write more and more complex texts. The NCTE/IRA *Standards for the English Language Arts* indicates that students should be able to "apply knowledge of language structure and language conventions (e.g., spelling and punctuation) . . . to create, critique, and discuss print and non-print texts" (36). The CTP 4 Writing Mechanics test at Level 10 measures students' growing facility with English sentence structure and language conventions.

The following is a list of the skills measured by the CTP 4 Writing Mechanics test at Level 10.

Spelling, Capitalization, and Punctuation
The student will be able to recognize spelling, capitalization, and punctuation errors. Specific elements tested include

- spelling of commonly used words, including words with affixes and words that display improper pluralization
- capitalization of proper nouns
- capitalization in titles and forms of address
- the correct use of the comma, semicolon, and colon
- the correct use of the apostrophe in contractions and possessives
- proper punctuation for dialogue and quotations
- correct end punctuation

Usage
The student will be able to apply rules of English diction and grammar. Specific rules tested include

- correct pronoun use, including pronoun-antecedent agreement
- correct verb form and tense, including subject-verb agreement and parallelism
- rules of correct and effective expression at the sentence level, including proper modification
- rules of diction within the context of a sentence
- rules regarding sentence boundaries, including avoiding run-ons and fragments and recognizing sentence types

Writing Concepts and Skills

The CTP 4 Writing Concepts and Skills test at Level 10 integrates students' developing facility with English grammar and usage with an increasingly sophisticated understanding of the writing process. As students continue to develop their writing skills, the ability to organize complex information and to recognize the multiple purposes and audiences for writing becomes increasingly important. According to the NCTE/IRA *Standards for the English Language Arts*, it is important that students be able to "employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes" (35).

The following is a list of the skills measured by the CTP 4 Writing Concepts and Skills test at Level 10.

Organization
The student will be able to
- recognize thesis statements, topic sentences, and conclusions
- recognize effective transitions between ideas, sentences, and paragraphs
- recognize effective and logical organization in a piece of writing
- understand and recognize various organizational strategies

Purpose, Audience, and Focus
The student will be able to
- recognize the role of the audience within varying contexts and draw logical conclusions about the intended audience for a given passage
- understand how the purpose for and focus of a piece of writing help determine the kind of information included and the appropriate style and tone of the piece

Supporting Details
The student will be able to
- draw conclusions based on supporting details in a passage
- determine the stated or implied purpose of supporting details within the context of a passage
- make judgments about the relative importance of supporting details to the passage as a whole
- recognize effective and relevant details to support points made in a piece of writing

Style and Craft
The student will be able to
- identify rhetorical features that contribute to the overall precision and style of a piece of writing
- identify the author's tone or voice in a piece of writing

Mathematics Achievement

The five content strands in the Level 10 Mathematics Achievement test are 1) Numbers and Number Relationships; 2) Geometry and Spatial Sense; 3) Data Analysis, Probability, and Statistics; 4) Algebra; and 5) Functions. This is the first level that specifically includes a content strand in functions. Additionally, topics included in Level 10 but not in Level 9 are
- understanding real and complex numbers

- performing operations with complex numbers
- understanding the application of mutually exclusive and independent events in probabilities
- solving and graphing second-degree equations and inequalities
- solving and graphing linear inequalities and solving linear programming problems
- understanding matrices and performing operations with matrices
- understanding conic sections and their relationships, with an emphasis on circles and parabolas
- understanding the properties and relationships of rational exponents
- understanding systems of equations and/or inequalities and their applications
- understanding functions and their graphs, including domain and range, and operations with functions such as composition
- understanding absolute value, logarithmic, and exponential functions
- using functions to represent and interpret real-world applications
- understanding and applying trigonometric functions in basic right-triangle situations
- using the trigonometric identity $\sin^2 x + \cos^2 x = 1$ in various situations

Along with subscores in the content strands, students will receive subscores in three process areas: Conceptual Understanding, Procedural Knowledge, and Problem Solving. In addition, students receive a subscore in Mathematics Communication if they take the constructed-response component of the achievement test.

The following is a list of the skills measured by the CTP 4 Mathematics Achievement test at Level 10.

Numbers and Number Relationships
The student will be able to
- understand different forms of complex and real numbers and the relationships between them, including rational and irrational real numbers and exponential and scientific notation
- understand properties of operations and perform operations with different forms of real and complex numbers
- apply different forms of real numbers in a variety of situations (forms include radicals)
- apply theories of whole numbers in a variety of situations

Geometry and Spatial Sense
The student will be able to
- use basic geometric language to classify and characterize properties of geometric figures, including quadrilaterals, triangles, circles, and three-dimensional figures, and apply basic theorems to these figures
- apply geometric properties and relationships to two- and three-dimensional figures, including the Pythagorean Theorem, sum of angle measures in a polygon, and triangle inequality; develop formulas to solve geometric problems; and use number line and coordinate geometry
- apply concepts of measure, including perimeter, circumference, surface area, volume, weight, angle measure, distance, and slope as they relate to parallel or perpendicular lines
- apply concepts of congruence, similarity, and simple transformation

Data Analysis, Statistics, and Probability
The student will be able to
• generate, organize, evaluate and interpret various data representations, including graphs, charts and histograms
• understand counting techniques for solving problems, including use of permutations and combinations; understand mean, median, mode, range, and standard deviation; and make conjectures or inferences from data provided
• determine probabilities, solve problems of chance using ratios and related probabilities, make predictions based on mathematical probabilities, and apply probabilities to mutually exclusive and independent events

Algebra
The student will be able to
• represent patterns and mathematical situations using tables, graphs, verbal rules, and equations
• understand properties of operations, including commutative and associative, understand rational exponents, and simplify algebraic and rational expressions
• solve and graph first- and second-degree equations and inequalities in one variable, solve literal equations for a variable, and understand conic sections and their equations
• understand systems of equations and inequalities and their applications and understand matrices and perform basic operations with them
• apply variables, expressions, and equations to solve real-world problems and mathematical problems including nonlinear equations
• understand slope, *x*- and *y*-intercepts, and relationships between parallel and perpendicular lines and apply these concepts to find an equation of a line, make predictions, and solve rate problems

Functions
The student will be able to
• understand properties of functions and their graphs, including domains and ranges
• understand the relationships between functions, their transformations, and their inverses and apply composition and other operations with functions
• apply trigonometric functions in right-triangle situations and use the fundamental trigonometric identity $\sin^2 x + \cos^2 x = 1$
• understand absolute value, logarithmic and exponential functions, and their applications to real-world problems, including exponential growth and decay and predictions of business trends

Math Communication (optional constructed-response section)
The constructed-response component of the Achievement tests assesses students' ability to communicate in mathematics. At this level, the work students will be able to do includes: evaluating data using standard deviation, using properties of similar triangles, sketching the graph of a quadratic equation, and using triangle inequality and special triangles to find lengths of sides.

Quantitative Reasoning

The Quantitative Reasoning test assesses students' ability to engage, in age-level appropriate ways, in pattern recognition, classification, and reasoning in all content areas, including logic, arithmetic, algebra, geometry, probability, and statistics.

The following is a list of the skills measured by the CTP 4 Quantitative Reasoning test at Level 10.

Comparison
The student will be able to
- consider numerical quantities in various forms and compare their sizes
- consider the relative measures of geometric shapes

Extensions and Generalizations
The student will be able to
- formulate arithmetic conclusions based on observation and mathematical judgment
- formulate geometric conclusions based on observation and mathematical judgment
- recognize patterns, logic problems, and geometric representation of reallife situations
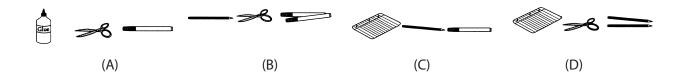
Analysis
The student will be able to
- interpret algebraic representations, including those in real-life situations
- interpret geometric representations, including applying properties in coordinate geometry
- evaluate statistical arguments, including counting principles, measures of central tendency, and interpretation of probabilities

Sample Questions, Levels 1-2

Auditory Comprehension*

It was time for art class. Miss Wang said, "Clear the papers from your tables. Then take out a pencil, scissors, and two markers."

1. Which picture shows what should be on the table?

(A)   (B)   (C)   (D)

This question asks students to recognize what each student in Miss Wang's class should have on his or her table after following the teacher's directions. The teacher told the students to "take out a pencil, scissors, and two markers." The correct answer, therefore, is (B).

Content Category: Explicit Information / Detail

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2. What did Miss Wang ask the class to do before they got out their art supplies?

Put on their art smocks	Take out some markers	Clear off their tables	Take out some paper
(A)	(B)	(C)	(D)

In this question, students are expected to recognize what Miss Wang's students were first instructed to do in preparation for the art class. Miss Wang told the students first to "clear the papers from [their] tables" and then to take out their art supplies (pencil, scissors, and two markers). Therefore, the correct answer is (C).

Content Category: Explicit Information / Detail

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*Note: Material read aloud to students is indicated in *italics*.

Reading Comprehension

Questions 1-3 are based on the following passage.

> Puddles the Duck did not like to be dry. He liked to be wet. "Where can I splash?" said Puddles. Puddles looked for a wet place. All of the places that once were wet, now were dry. " Where can I find water?" he asked. He went to find Cow. " Hi, Cow," said Puddles. " I am looking for water."
>
> " It has been very dry. But there is water by the barn," said the cow. " Farmer Dodd put a tub of water there."
>
> " Oh, boy!" <u>cried</u> Puddles. " Water!" Away ran Puddles.

1. What will Puddles do next?

    (A) Run to the puddle

    (B) Run to the tub of water

    (C) Ask Cow where to find water

    (D) Ask Farmer Dodd to get some water

In the story, Puddles is looking for water, and Cow tells him that there is a tub of water by the barn. The question asks students to predict what Puddles is likely to do next. Puddles' excitement at Cow's response clearly indicates that Puddles is headed for the water Cow described. The correct answer, therefore, is (B).

Content Category: Analysis / Prediction

2. What is the best title for this story?

(A)   The Duck Who Liked to Be Dry

(B)   Fun in the Barn

(C)   Farmer Dodd's Cow

(D)   Puddles the Duck

The question asks for the best title to this story. Option (A) can be eliminated because it contradicts the story, which indicates that Puddles would rather be wet than dry. Option (B) can easily be eliminated, since having fun in the barn is not mentioned in the story. Choice (C) is more plausible, since Cow is mentioned in the story; however, the story's main focus is not on Cow. The story is about Puddles. Therefore, (D) is the best answer.
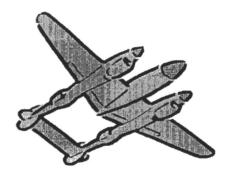
Content Category: Inference / Summarize

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3. What does <u>cried</u> mean in the story?

(A)   yelled

(B)   looked

(C)   sobbed

(D)   splashed

This question asks students to recognize the meaning of the word " cried" as it is used in the story. While one meaning of crying is to " sob," nothing in the passage indicates that Puddles is sad; therefore, (C) can be eliminated. In the story, Puddles cried " Oh, boy!" and " Water!" The use of the exclamation marks in these comments and Puddles' running indicate his excitement. Puddles most likely " yelled" these comments. Therefore, (A) is the correct answer.

Content Category: Vocabulary in Context

Be the first to have a new

STAR WING SUPERSONIC PLANE

This toy is made of tough plastic painted with flames
that look real. It comes with a pilot and his own parachute.

Includes small map and compass.

You can make this plane do loops, dips, and big circles by
moving it through the air.

Real flying sounds like sirens and the roar of jet engines.
Batteries not included.

The Plane is 12 inches across and 5 inches high.

ONLY $15.00

Hurry! Supplies limited!
At a toy store near you!

4. What can make this plane move through the air?

(A) The pilot

(B) Batteries

(C) Jet engines

(D) The person playing with it

The question asks students to recognize how this toy plane moves through the air. Choice (A) might appeal because "pilots" do fly planes; however, this is a toy that must be operated by a person. Options (B) and (C) are also likely to appeal, but they too are incorrect; the batteries supply the sounds of the jet engines. The correct answer is (D). According to the ad " you can make this plane do loops, dips, and big circles by moving it through the air."

Content Category: Inference / Draw Conclusions

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5. Why is this ad in the paper?

(A) So you will have fun

(B) So you will buy batteries

(C) So you will buy this toy plane

(D) So you will tell your friends

In this question, students are expected to understand the primary reason for this ad being in the newspaper. While having fun (A) and buying batteries (B) might result from owning the plane, and telling your friends about the plane (D) might make more people want to buy it, the description of the toy plane and the mention of its cost clearly indicate that the primary purpose of this ad is to get the reader to buy the plane. This purpose is reinforced by the closing statements " Hurry!"" Supplies limited!"" At a toy store near you!" Therefore, (C) is the correct answer.

Content Category: Analysis / Make Connections

Reading Comprehension - Optional Constructed-Response Questions

> **Read Passage 1 to find out about a boy who sees sea lions at the circus.**
>
> ### Sea Lions at the Circus
>
> The circus was here! Ramon and his dad got there early. They found good seats in the front row with excellent views. They wanted to see the sea lions. They laughed as the sea lions waddled into the circus ring. They all looked so clumsy. Their trainer held up a horn to their mouths and the sea lions played music. Ramon and his dad clapped. Then the sea lions clapped their flippers together. That made Ramon and his dad clap even more.
>
> The trainer threw a beach ball to the first sea lion. That sea lion threw it to another one. Soon all the sea lions were playing catch. Every time the sea lions did a trick, the trainer threw a fish treat to them. At the end of the show, the sea lions climbed up a ladder and shot down the slide.
>
> When they hit the water, Ramon and his dad got splashed. They got very wet and cold, but they knew they would dry off soon. They clapped and clapped. The sea lions clapped too.
>
> Maybe some day Ramon and his dad can watch the sea lions in the water where they live. In the circus ring, the sea lions look funny and make us laugh. But in the sea they are fast and graceful.

1. Name the tricks that the sea lions did at the circus. Include at least three examples in your response.
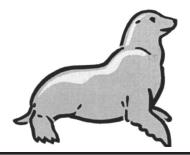

In order to receive a 2 (the highest score) on this question, the student must show clear and solid understanding of the tricks that the sea lions did at the circus. The response must include at least **three** of the following tricks.

- played music/played horns
- clapped
- played catch/threw ball
- climbed ladder
- went down the slide
- splashed people

A score of 1 indicates that a student shows basic (but in some way incomplete) understanding of the tricks that the sea lions did at the circus; the response must include **one or two** of the tricks listed above.

A score of 0 indicates that a student shows very little or no understanding of the tricks that the sea lions did at the circus; a response in this category mentions none of the tricks listed above or gives only incorrect information.

Content Category: Reading for Understanding

Read Passage 2 to learn about how sea lions live in the sea.

Sea Lions in the Sea

People like to watch the sea lions at the circus. The sea lions look funny as they drag their large, heavy bodies around the ring. We laugh at them because they look really clumsy.

The best place to watch the sea lions is in the sea, not on dry land. At home in the water, they swim fast and they are graceful.

To get their food, sea lions must chase fish. The fish swish back and forth, hoping they will not get caught. But the sea lions follow them at great speed. They twist and turn their necks close behind the fish. The sea lions are even faster than the fish. One sea lion can catch up to 40 pounds of fish every day.

Sea lions have their babies in the spring. A baby sea lion stays with its mother for about a year. The mother will keep it safe. Mothers will also make sure their babies have plenty to eat. The babies spend their time eating and growing. They eat fish, octopus, and seabirds.

82 **2.** These two stories tell how sea lions are different at the circus and in the sea. Fill in this chart to show how they are different in those two places.

Sea Lions at the Circus	Sea Lions in the Sea
This is what the sea lions eat at the circus:	This is what the sea lions eat in the sea:
This is how the sea lions move at the circus:	This is how the sea lions move in the sea:
This is how the sea lions get their food at the circus:	This is how the sea lions get their food in the sea:

In order to receive a 2 (the highest score) on this question, the student must show clear andsolid understanding of how sea lions are different at the circus and in the sea. The student must fill in each of **five or six** cells with at least one correct response, as indicated by the following list.

- **Sea Lions at the Circus**

  What they eat:

  fish/fish treats

  How they move:

  clumsy/funny/drag their bodies/waddle

  How they get their food:

  from doing tricks/from the trainer

- **Sea Lions in the Sea**

  What they eat:

  fish/octopus/seabirds/40 pounds of fish

  How they move:

  fast/graceful

  How they get their food:

  catch fish

A score of 1 indicates that the student shows basic (but in some way incomplete) understanding of how sea lions are different at the circus and in the sea; the student must fill in **three or four** cells with at least one correct response (as indicated by the list above).

A score of 0 indicates that the student shows very little or no understanding of how sea lions are different at the circus and in the sea. To receive a score of 0, the student must have filled in only **one or two** of the above cells with a correct response or given only incorrect information.

Content Category: Reading for Understanding

*Word Analysis**

1. *Which word has the same vowel sound as the word <u>seem</u>?*

top	seat	wet	shoe
(A)	(B)	(C)	(D)

The question asks students which word has the same vowel sound as the word <u>seem</u>. Recognition of the long ē sound is being tested. "Seat" is most similar in sound to the word "seem"; therefore, (B) is the correct answer.

Content Category: Phonemic Analysis / Medial Vowel Sounds

2. *Which word ends with the same sound as the word <u>band</u>?*

sing	long	any	wind
(A)	(B)	(C)	(D)

This question asks students to recognize which word **ends** with the same sound as the word band. "Wind," (D), and "band" end in the same sound, the consonant blend "nd." Therefore, (D) is the correct answer.

Content Category: Phonemic Analysis / Final Consonant Sounds

3. *Look at the four underlined words in the sentence. Fill in the bubble under the one that is a compound word.*

The <u>children</u> may not use the <u>school</u> <u>playground</u> when it is <u>raining</u>.
    (A)   (B)   (C)   (D)

In this question, students are to select the choice that is a compound word. (C) is the correct answer because it is the only word made up of two independent words with distinctive meanings.

Content Category: Structural Analysis / Compound Words

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*Note: Material read aloud to students is indicated in *italics*.

Writing Mechanics

For questions 1 and 2, find the word that goes in the blank to make the sentence correct.

1. _____ going to take a long time to fix the car.

Its'	It	It's	Its
(A)	(B)	(C)	(D)

In this question, students are being tested on the difference between " its," meaning " belonging to it" and " it's," meaning " it is." In this sentence, the blank represents a missing subject and verb; therefore, the correct answer is (C).

Content Category: Punctuation / Apostrophe

2. Most little _____ _____ puppies.

kid like	kids like	kids likes	kid likes
(A)	(B)	(C)	(D)

This question asks students to select the choice that reflects correct subject-verb usage, thereby making the sentence correct. The use of the word " Most" indicates that the subject of this sentence will be plural; therefore, the correct answer must have a plural subject with a corresponding plural verb. Option (A) is incorrect because the subject is singular and also because the verb form is plural; subject and verb must agree in number. Option (D), though correct in subject-verb agreement, is still wrong, since the subject is again singular, and option (C), with its plural subject, is incorrect because the verb is singular. Option (B) is therefore the correct answer.

Content Category: Usage / Verb Form and Tense
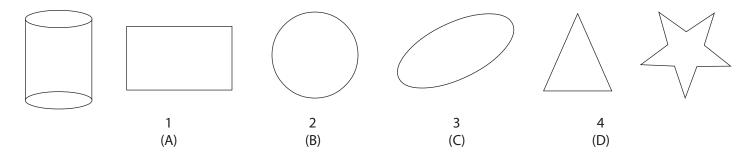
Sample Questions, Levels 1-2

Mathematics*

1. *A class of 13 boys and 16 girls went on a field trip. Two teachers also went on the field trip. Which number sentence can be used to find how many people went on the field trip?*

$$13 + 16 + 2 = \boxed{} \qquad 13 + 16 - \boxed{} = 31 \qquad 13 - 16 + 2 = \boxed{} \qquad 13 + 16 + \boxed{} = 29$$

(A)   (B)   (C)   (D)

The problem asks for a number sentence that can be used to find the total number of people that went on the field trip. This total number is the sum of the numbers of boys, girls, and teachers that went on the field trip. Since 13 boys, 16 girls, and 2 teachers went on the field trip, the correct number sentence requires the expression 13 + 16 + 2. The correct answer is choice (A).

Content Category: Patterns, Functions, and Pre-Algebra / Conceptual Understanding

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2. *How many of the shapes have only straight edges?*

1	2	3	4
(A)	(B)	(C)	(D)

The only shapes that contain only straight sides are the rectangle, the triangle, and the star.
There are 3 shapes having only straight sides. The correct answer, therefore, is choice (C).

Content Category: Geometry and Spatial Sense / Conceptual Understanding

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*Note: Material read aloud to students is indicated in *italics*.
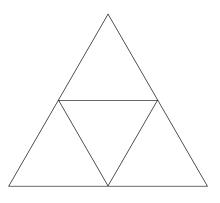
3. *There were 58 children on the playground outside. After recess, 27 went back inside. How many were still on the playground outside?*

31 (A) 35 (B) 49 (C) 85 (D)

There were initially 58 children on the playground outside, and 27 children went back inside after recess. The number of children that were still on the playground outside is given by the difference 58 − 27. This difference is 31. The correct answer is choice (A).

Content Category: Number Sense and Operations with Whole Numbers / Problem Solving

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4. *How many triangles are in the picture?*

2 (A) 3 (B) 4 (C) 5 (D)

To solve this problem, notice that there are four smaller triangles inside of one larger triangle. Therefore, the total number of triangles in the picture is 5. The correct answer is choice (D).

Content Category: Geometry and Spatial Sense / Problem Solving

Mathematics Optional Constructed-Response Questions

1. A pattern of buttons is shown below. Draw the next 3 buttons in the pattern.

_____   _____   _____

Notice that the button pattern contains two characteristics – button size and the number of button holes. The button size alternates back and forth between small and large. The number of button holes alternates back and forth between two holes and four holes. The next three buttons in the pattern should therefore be a large button with four holes, followed by a small button with two holes, followed by a large button with four holes. To score a 1 on this question, students could show an understanding of this pattern but start with the incorrect button. Another way students can score a 1 on this question is to have only the number of button holes correct or only the button size correct in their pattern.

Content Category: Math Communication

2. For each number below, write the number that is 1 more, 10 more, and 100 more on the blank line. The first number is done for you as an example.

	1 more	10 more	100 more
5	6	15	105
109			
489			
2,699			
30,500			

To solve this problem, each number in the left-hand column is to be added to 1, 10, and 100, respectively. The correct answers for each row are given below. To score a 1 on this question, a student must fill in 2 or 3 rows completely correctly.

	1 more	10 more	100 more
5	6	15	105
109	110	119	209
489	490	499	589
2,699	2,700	2,709	2,799
30,500	30,501	30,510	30,600

Content Category: Math Communication

Sample Questions, Level 3

Verbal Reasoning

1. Which lettered pair of words goes together in the same way as the first pair of words?

SNIFF : SMELL ::

(A) glance : look

(B) seek : find

(C) talk : gossip

(D) buy : sell

The correct answer to this reasoning problem is (A). The two terms in the original pair are related by degree: to sniff is to smell quickly. Only the pair of words in option (A) has an analogous relationship: to glance is to look quickly.

Content Category: Analogical Reasoning

2. Jamal and Alison have made up their own language. In this language, *tiff lam* means "they are," *bon lam* means "we are," and *bon sen* means "we will."

How would you say "they will" in Jamal and Alison's language?

(A) *Tiff sen*

(B) *Tiff bon*

(C) *Bon bon*

(D) *Bon tiff*

To answer this question, the student must determine which words defined in the problem mean *they* and *will*. Since *tiff lam* means *they are* and *bon lam* means *we are*, *lam* must mean *are* and *tiff* must therefore mean *they*. Knowing only that *tiff lam* means *they are* would not provide enough information to determine which word means *they*, because it is not necessarily the case that word order in Jamal and Alison's language follows the same rules as English. Using similar rules of induction, it can be determined that *sen* means *will*. The correct answer is (A).

Content Category: Logical Reasoning / Inductive Reasoning

Auditory Comprehension

Listen very carefully while I tell you a story from China that is very much like "Little Red Riding Hood."

Once, long ago, there was a woman who lived alone in the country with her three children —
Shang, Tao, and Paotze. On the day of their grandmother's birthday, the good mother set off to see her,
leaving the three children at home.
Before she left, she said, "Be good while I am away, my heart-loving children; I will not return
tonight. Remember to close the door tight at sunset and <u>latch</u> it well."
But an old wolf lived nearby and saw the good mother leave. At dusk, disguised as an old
woman, he came up to the house of the children and knocked on the door twice: bang, bang.
Shang, who was the eldest, said through the latched door, "Who is it?"
"My little jewels," said the wolf, "this is your grandmother, your Po Po."
"Po Po!" Shang said. "Our mother has gone to visit you!"

1. *Where did the "good mother" go?*

To the market (A)	To the wolf's house (B)	To visit the grandmother (C)	To latch the door (D)

The question asks the students to recall an important detail of the plot of the story. Only (C) is an accurate account of where the "good mother" went, so option (C) is the correct answer.

Content Category: Explicit Information / Detail

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*Note: Material read aloud to students is indicated in *italics*.

2. *What does the word latch mean in the story?*

Close	Lock	Bang	Guard
(A)	(B)	(C)	(D)

This question asks students to determine the meaning of the word "latch" in the context of the story. "Latch" means to shut tightly so that a latch is engaged. Option (A) is appealing but not accurate, since closing a door does not mean fastening it with a latch. Only (B) involves fastening the door, so option (B) is the correct answer.
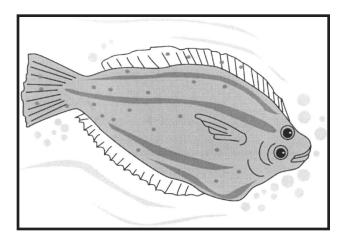
Content Category: Vocabulary in Context

3. *Why did the wolf disguise himself as an old woman?*

He wanted to talk to the grandmother.	He did not like the way his fur looked.	He wanted to fool the children.	The mother might see him.
(A)	(B)	(C)	(D)

This reasoning question asks students to infer from the story the wolf's reason for disguising himself as an old woman. The only option that offers a likely explanation for the wolf's behavior is (C): the wolf disguised himself to fool the children. The other options don't make logical sense and/or are not supported by the details in the story.

Content Category: Inference / Motives and Behaviors

Why Are Some Fish Flat?

Flatfish, such as flounder or sole, hatch from eggs like other fish. They hatch near the surface of the sea and start life with a normal fish shape. But when they are just a few weeks old, their shape begins to evolve.

First of all, one eye moves around to the other side of the fish's head so that both eyes are on the same side. Then the fish swims down to lie on the seabed. It lies on its blind side with both its eyes staring upward.

Then gradually, the fish's body flattens out. Instead of a right and a left side, a flatfish has a top and a bottom side. Flatfish spend most of their lives lying on the seabed. Their shape helps them hide from enemies and catch food more easily. Their top sides are often the same color as the seabed, so that they can take prey by surprise.

1. What enables flatfish to take their prey by surprise?

    (A)   Their color is the same as the seabed.

    (B)   Both eyes are on the same side of the fish.

    (C)   They can swim very fast.

    (D)   Their body is flat.

This question asks students to determine which characteristic of flatfish enables them to take their prey by surprise. The student must recall information provided in the end of the passage: a fish can blend in with the seabed and therefore surprise its prey. Option (A), which specifically addresses this point, is the correct answer. Option (D) is appealing, but while the passage indicates that the fish's flat shape helps it "catch food more easily," it does not specifically state that the fish's shape helps it take prey by surprise. Therefore, (A) is the best answer.

Content Category: Explicit Information / Detail

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2. What is the main idea of the passage?

    (A)   Flounder and sole are specific kinds of flatfish found in the ocean.

    (B)   Flatfish have special features that make them different from other fish.

    (C)   Flatfish have both eyes on the same side of their body.

    (D)   The shape of flatfish helps them catch prey.

This question asks students to recognize the main idea of the passage, as opposed to a secondary or supporting idea. All of the options are points made in the passage, but only (B) states the main idea of the passage: flatfish have unique features that distinguish them from other fish.

Content Category: Explicit Information / Main Idea

3. Flatfish are different from most other fish in all of the following ways EXCEPT:

(A) Flatfish have both eyes on the same side of their body.

(B) Flatfish have a top and bottom instead of a right and left side.

(C) Flatfish lay eggs in the water.

(D) Flatfish spend most of their lives lying on the seabed.

The student must perform two different tasks to determine the answer to this question. First, the student must decide which option is a characteristic that is NOT unique to flatfish. Options (A), (B), and (D) all describe characteristics that ARE unique to flatfish. Second, the student must infer from the passage that flatfish lay eggs in the water, since the passage indicates that flatfish "hatch from eggs like other fish." The correct answer, then, is option (C).

Content Category: Analysis / Draw Conclusions

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4. The author probably wrote this passage to

(A) convince people to eat flatfish

(B) teach people how to catch flatfish

(C) teach people about flatfish

(D) warn people about flatfish

This question asks students to infer from the passage the author's purpose in writing the passage. Only (C) offers a likely purpose, given the content of the passage, which is a discussion about the distinctive features of flatfish. Therefore, (C) is the correct answer.

Content Category: Inference / Motives and Behaviors

Reading Comprehension — Optional Constructed-Response Questions

Read Passage 1 to learn more about eagles.

The eagle is a beautiful bird. It is one of the largest birds in the world. The bald eagle is the national symbol of the United States. But it is not bald at all. It is called the bald eagle because the feathers on its head and neck are pure white.

Eagles have large, strong beaks. The beak is very sharp and pointed. The top half of the beak curves down over the bottom half. Eagles are good hunters. They have large, powerful claws. They can swoop down out of the sky to catch a small animal like a mouse or even a fish.

Many people think the eagle is a sign of strength and bravery. It is also a symbol of freedom. The picture of the eagle is on the Great Seal of the United States and also on the President's seal. You can also find a picture of an eagle on some U.S. coins and paper money.

When people think of eagles, they think of power, courage, and skill. Because of this, many groups use the eagle as their symbol. Some sports teams use the eagle as their mascot. They call their team The Eagles. They want people to think their players are strong and brave.

1. According to Passage 1, where are three places where you might find pictures of eagles?

In order to receive a 2 (the highest score) on this question, the student must show clear and solid understanding of three places where one might find pictures of eagles; the student's response must include **three** of the following.

- Great Seal (of the United States)
- presidential seal
- paper money
- coins
- mascot (for sports team)

To receive a score of 1, the student must show basic (but in some way incomplete) understanding of places where one might find pictures of eagles; the student's response must include **one** or **two** of the above.

A score of 0 indicates that the student shows very little or no understanding of places where one might find pictures of eagles; a response in this category mentions none of the places listed above or gives only incorrect information.

Content Category: Reading for Understanding

Read Passage 2 to learn what the students at Eastside Elementary School voted for.

The students at Eastside Elementary School wanted to have a new school symbol. The principal told the students that many schools choose an animal as a school symbol. A school's symbol is also called a mascot. This is what the principal said the mascot should be.

- It should be something that is special to the students.
- It should be something that makes them feel proud.
- It should be fun.

The students talked about what they wanted their school mascot to be. Mallory said she thought the eagle would be a good symbol for their school. Here are some reasons that Mallory gave.

- We could be called the Eastside Eagles. The name has a nice sound to it.
- We can get an eagle costume and have someone wear it at our school events.
- We can put the symbol on our school flag.
- The eagle will make a nice design.

The Eastside students voted on their school mascot. They also had a contest to have someone draw the school symbol. This is the symbol they chose. It was drawn by Maria.

2. According to what you read in Passage 1 about why some people choose the eagle as a symbol or mascot, how do you think the Eastside students want people to think of their school? Give at least two examples.

In order to receive a 2 (the highest score) on this question, the student must show clear and solid understanding of what the choice of an eagle as school symbol indicates about how the Eastside students want people to think of their school; the student's response must include **two** of the following.

- powerful/strong
- courageous/brave
- skillful
- beautiful
- free
- representing the United States

In order to receive a score of 1, the student must show basic (but in some way incomplete) understanding of what the choice of an eagle as school symbol indicates about how the Eastside students want people to think of their school; the student's response must include **one** of the examples listed above.

A score of 0 indicates that the student shows very little or no understanding of what the choice of an eagle as school symbol indicates about how the Eastside students want people to think of their school; a response in this category mentions none of the examples listed above or gives only incorrect information.

Content Category: Reading for Understanding

Writing Mechanics

1. Find the punctuation error in the sentence, if there is one.

Mr. Lee_,_ the art teacher_,_ is having the students create a mural. "I want to draw a dolphin,"
      (A)   (B)

remarked Sarah. "They're the best_!"_   No error
                      (C)   (D)

This question asks students to recognize the correct use of commas and end punctuation. Since all of the underlined punctuation marks are correct, the answer is (D), or No error.

Content Category: Punctuation

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2. Find the capitalization error in the sentence, if there is one.

Many students at Rosewood _E_ lementary _S_ chool speak _r_ ussian. No error
                         (A)   (B)   (C)   (D)

This question asks students to identify a capitalization error. Since the names of groups of people and their languages should be capitalized, the lowercase "r" in "russian" is incorrect. Therefore, (C) is the correct answer.

Content Category: Capitalization / Proper Noun

Writing Concepts and Skills

1. Choose the best way of stating the idea.

   (A)   Jean planted flowers that were hers and watered her flowers.

   (B)   Jean planted and watered her flowers.

   (C)   Jean watered her flowers and planted them.

   (D)   Jean planted and Jean watered her flowers.

This question asks students to determine which statement is the most sensible and concise. Options (A), (C), and (D) are either illogical or unnecessarily wordy. (B) is the only option that makes a sensible and concise statement: Jean planted and watered her flowers.

Content Category: Style and Craft / Sentence Construction

2. Which topic would be best to use in a report about learning to swim?

   (A)   What creatures cannot live in salt water

   (B)   Fun at a pool party

   (C)   How to hold your breath while swimming under water

   (D)   The need for fences around pools

This question asks students to choose an appropriate topic for discussion in a report about learning to swim. Only (C), which describes a skill important in learning to swim, is relevant to this topic, so option (C) is the correct answer.

Content Category: Purpose, Audience, and Focus / Relevant Information

3. The sentence at the beginning of the question is the main idea of a paragraph. Decide which of the choices goes best with the main idea.

Snails prefer dark and moist areas.

(A)   Snails move slowly.

(B)   Snails spend time in shells.

(C)   Snails crawl on rainy nights.

(D)   Snails eat plants.

This question asks students to select the option that supports the statement "Snails prefer dark and moist areas" with appropriate details. Since (C) is the only option that refers to places that are both dark and moist ("Snails crawl on rainy nights"), option (C) is the correct answer.

Content Category: Supporting Details / Relevant

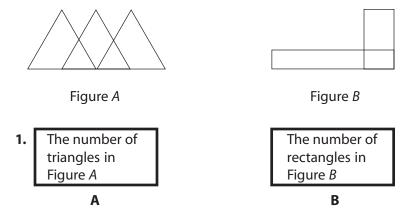**4.** Choose the opening sentence that goes best with the details in the paragraph.

_____. When they arrive there, the females give birth in the warm lagoons. They journey back in summer to the cold waters of the Arctic.

(A)   Gray whales push water out of their mouths.

(B)   Gray whales feed by swimming on their sides.

(C)   Some whales live in the North Atlantic.

(D)   Gray whales travel in the winter to warm water.

This question asks students to choose the topic sentence that is best supported by the details provided in the rest of the paragraph. The paragraph describes female whales traveling to warm lagoons to give birth and then returning to cold waters in the summer. Only option (D) refers to whales traveling in winter to warm water, so (D) is the correct answer.

Content Category: Organization / Topic Sentences

Quantitative Reasoning

Figure *A*   Figure *B*

1.

| The number of triangles in Figure *A* | The number of rectangles in Figure *B* |

A   **B**

Which statement is true?

(A)   A is greater than B.

(B)   B is greater than A.

(C)   A and B are equal.

This is a quantitative comparison question in which students are asked to compare the number of shapes contained in two figures. Figure A contains 5 triangles. There are 3 large triangles that overlap. There are also 2 smaller triangles formed by the large overlapping triangles. Figure B contains 5 rectangles. There are 3 different-sized rectangles shown. There are also 2 larger rectangles that consist of 2 of the smaller rectangles. So, the number in column A is the same as the number in column B. The correct answer is choice (C).

Content Category: Comparison

2. Which number would NOT appear in the pattern 4, 8, 12, 16, … ?

(A) 20

(B) 32

(C) 50

(D) 100

The pattern formed by the numbers shown must be recognized. Each number in the pattern is a multiple of 4. Of the answer choices only one is NOT a multiple of 4. The only choice that is not a multiple of 4 is 50. The correct answer is choice (C).

Content Category: Extensions / Generalizations

Mathematics

1. How many of the numbers from 1 to 20 are odd?

    (A) 7

    (B) 8

    (C) 10

    (D) 11

There are 20 numbers from 1 through 20. Half of the numbers are even and half of them are odd. Therefore, there are 10 odd numbers from 1 to 20. The correct answer is choice (C).

Content Category: Number Sense and Operations with Whole Numbers / Conceptual Understanding

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2. Which of these could be the height of a stop sign?

    (A) 2 meters

    (B) 6 meters

    (C) 800 centimeters

    (D) 1,000 centimeters

The height of a stop sign must be estimated. Most stop signs are a little taller than an average adult. So you can estimate that a stop sign is between 6 and 8 feet tall. Of the answer choices, only one is close to this height. The first two choices are in meters. One meter is a little longer than a yard, which is 3 feet. Therefore, 2 meters is a little more than 6 feet. This is close to the height of a stop sign, so the correct answer is (A). Choice (B) is more than 18 feet, which is too high. There are 100 centimeters in a meter. Therefore, 800 centimeters is the same as 8 meters and 1,000 centimeters is the same as 10 meters. These are also too high.

Content Category: Measurement / Conceptual Understanding

Questions 3-4 refer to the following information.

Watermelon
83¢ per pound

Oranges
$4.00 per box

3. How much does a 7-pound watermelon cost?

(A) $5.61

(B) $5.71

(C) $5.74

(D) $5.81

The price of watermelon is 83 cents per pound. To find the cost of a 7-pound watermelon you need to multiply 7 times 83 cents, which is 581 cents. This is the same as $5.81. The correct answer, therefore, is choice (D).

Content Category: Number Sense and Operations with Fractions and Decimals / Problem Solving

4. How many boxes of oranges can be bought with $35.00 ?

(A) Six

(B) Seven

(C) Eight

(D) Nine

Each box of oranges costs $4.00. To find out the number of boxes of oranges that can be bought with $35.00, divide 35 by 4.

$$\begin{array}{r} 8R3 \\ 4{\overline{\smash{\big)}\,35}} \end{array}$$

Since the answer is 8R3, 8 boxes can be bought with $35.00. Eight boxes of oranges cost 8 times $4.00 or $32. Nine boxes cost 9 times $4.00 or $36, which is over the $35.00. Therefore, 8 boxes can be bought with $35.00. The correct answer is choice (C).

Content Category: Number Sense and Operations with Fractions and Decimals / Problem Solving

Mathematics - Optional Constructed-Response Questions

1. Petra is 4 feet 9 inches tall. Her father is 6 feet 3 inches tall. Petra wanted to find out how much taller her father is than she is.

   Here is her work.

$$
\begin{array}{r r}
\overset{5}{\cancel{6}} \text{ ft} & \overset{13}{\cancel{3}} \text{ in} \\
- \quad 4 \text{ ft} & 9 \text{ in} \\
\hline
1 \text{ ft} & 4 \text{ in}
\end{array}
$$

Petra's work is <u>not</u> correct. Explain what she did wrong and give the correct answer.

This question asks students to explain the mistake that Petra made in her work. She wanted to figure out how much taller her father is than she is.

The first step is to figure out what mistake Petra made. Petra converts 6 feet 3 inches to 5 feet 13 inches. Since there are 12 inches in a foot, 6 feet is equal to 5 feet 12 inches. Therefore, 6 feet 3 inches equals 5 feet 15 inches. Petra got 5 feet 13 inches. She added 10 inches for 1 foot instead of 12 inches.

Here is what she should have done:

$$
\begin{array}{r r}
\overset{5}{\cancel{6}} \text{ ft} & \overset{15}{\cancel{3}} \text{ in} \\
- \quad 4 \text{ ft} & 9 \text{ in} \\
\hline
1 \text{ ft} & 6 \text{ in}
\end{array}
$$

Petra's dad is 1 foot 6 inches taller than Petra.

Here's another way to figure this out.

From 4 feet 9 inches to 5 feet is a difference of 3 inches. From 5 feet to 6 feet is a difference of 1 foot. From 6 feet to 6 feet 3 inches is a difference of 3 inches. The total difference from 4 feet 9 inches to 6 feet 3 inches is 1 foot 6 inches.

If a student has the correct answer with no explanation (or an incomplete explanation), the student will receive a score of 1. The student will also receive a score of 1 if he or she has a correct explanation but does not give the correct answer.

Content Category: Math Communication

2. In a cooking class, John is making omelets for 26 children. Each omelet needs 3 eggs. How many <u>dozen</u> eggs does John need?

Use drawings, words, or numbers to explain your answer. Show all your work.

This question is asking you to figure out how many dozen eggs John needs and to explain how you found your answer. The first step is to figure out how many eggs John needs. If he is making 26 omelets and each omelet needs 3 eggs, he needs 78 eggs, since 26 x 3 = 78.

Next you need to find out how many dozen this is. There are 12 eggs in 1 dozen. To find out how many dozen is equal to 78 eggs, you divide 78 by 12.

```
       6R6
 12) 78
      72
       6
```

John needs 6 dozen plus 6 more eggs. So he needs 6 $\frac{1}{2}$ dozen or 7 full dozen cartons of eggs.

Students need to show all of the steps in finding the correct answer in order to receive a score of 2. They must show work for finding the 78 eggs. Then they must show how to find how many dozen eggs this is. They then need to explain what 6R6 means – it is 6 dozen plus another 6 eggs, which is 6 $\frac{1}{2}$ dozen. If John can only buy eggs in 1 dozen cartons, he'll have to buy 7 cartons.

If students find that John needs 78 eggs but they do not find the correct number of dozens needed, they will receive a score of 1. If students answer 6 dozen and work indicates they did not know how to handle the remainder, they will also get a score of 1.

Content Category: Math Communication

Sample Questions, Levels 4-6

Verbal Reasoning

1. Which lettered pair of words goes together in the same way as the first pair of words?

HOARD : DISPERSE ::

(A) obtain : acquire

(B) oppose : disapprove

(C) save : spend

(D) donate : support

The correct answer to this question is (C). The two terms in the original pair have an oppositional relationship: to hoard (to accumulate or stockpile) is the opposite of to disperse (to scatter or disseminate). Only the words in option (C) are also opposites.

Content Category: Analogical Reasoning

2. Which of the following words does NOT belong with the others?

(A) Planet

(B) Spaceship

(C) Meteor

(D) Asteroid

The correct answer to this categorical reasoning problem is (B). All of the objects on the list can be found in outer space; however, planets, meteors, and asteroids are all naturally occurring, while spaceships are made by humans.

Content Category: Categorical Reasoning / Fit

3. If most mountains have jagged peaks, and if Stowe is a mountain in Vermont, then

    (A)   Stowe is the only mountain in Vermont with a jagged peak

    (B)   all things with peaks are mountains

    (C)   Stowe is probably over 15,000 feet high

    (D)   Stowe probably has a jagged peak

In this deductive reasoning problem, the premises are that Stowe is a mountain and that most mountains have jagged peaks. The conclusion to be drawn, therefore, is that Stowe probably has a jagged peak. The correct answer, then, is (D).

Content Category: Logical Reasoning / Deductive Reasoning

Vocabulary

Questions 1- 4 are based on the passage below.

>   Deep and shaded by alders, this <u>perennial</u> creek has carved a canyon that offers <u>scores</u> of places to spend an afternoon. The canyon's beauty begins at road's edge. Alders thickly covered with green leaves flutter in the breeze, and twenty yards upstream are the first
> *Line* pools. With the canyon walls and alder boughs for privacy, sandstone boulders for resting
>   *5* spots, and the creek's <u>never-ending</u> <u>babble</u> for companionship, you'll fall in love with it in *5*
>   no time.

1.   Which of the following phrases most nearly means the same as the word <u>perennial</u> in line 1 ?

    (A)   specific to one place

    (B)   winding around

    (C)   constant throughout the seasons

    (D)   pretty and delightful

The word *perennial* in this context means lasting or enduring for an indefinitely long time, especially in terms of remaining unchanged throughout the seasons of the year. Therefore, option (C) is the best answer.

Content Category: Application / Synonym

2. Which of the following phrases most nearly means the same as the word <u>scores</u> as it is used in line 1 ?

(A) musical compositions

(B) large numbers

(C) privacy and shelter

(D) indefinitely repeating patterns

The correct answer to this question is (B). In the phrase "scores of places to spend an afternoon," only "large numbers" makes sense in place of "scores," which is defined in this context as "a great many."

Content Category: Application / Synonym

3. Which of the following words is more precise than the word <u>never-ending</u> in line 5 ?

(A) incessant

(B) raucous

(C) interrupted

(D) occasional

In this question, the students are looking for a word that is more precise in meaning than "never-ending." Option (A) is the correct answer because that which is "incessant" is by definition continual and "never-ending."

Content Category: Application / Synonym

4. Which of the following phrases most nearly means the same as the word <u>babble</u> in line 5 ?

(A) jovial conversations

(B) private conversations

(C) friendly movements

(D) sounds with no specific meaning

This question asks the students to recognize that "babble" means "meaningless or unintelligible sounds"; therefore, the correct answer is (D).

Content Category: Application / Synonym

5. Choose the word that best fist in the context of the sentence.

Dr. Martin Luther King, Jr., an advocate of nonviolent protest, never _____ his belief in this form of resistance.

(A) conquered

(B) acknowledged

(C) abandoned

(D) maintained

Option (C) is the correct answer because the sentence makes the most logical sense when "abandoned" is inserted in the blank. To answer the question, students must recognize that "this form of resistance" in the sentence is a reference to "nonviolent protest," of which Dr. King was an advocate. Therefore, options (B) and (D) do not make sense in the context of the sentence; Dr. King would clearly have acknowledged and maintained a belief in something he advocated. The word "conquered" in option (A), while closer in meaning to "abandoned," does not fit logically
or idiomatically.

Content Category: Precision

6. Choose the pair of words that best fits in the context of the sentence.

Walking into the museum with a feeling of _____and expectation, Magda was so _____to get started that she overlooked the map posted at the entrance.

(A)   boredom . . eager

(B)   dread . . happy

(C)   excitement . . anxious

(D)   anticipation . . unwilling

In this question, the students are looking for precise words that make the most logical sense in the sentence. The first blank reveals that Magda's feelings are linked to ones of "expectation." The sentence also indicates that she "overlooked" information. In what circumstances would "expectation" about something cause one to "overlook" crucial information? (C) is the correct answer. One who shows "excitement and expectation" could become so "anxious" as to not take notice of things.

Content Category: Precision

Reading Comprehension

Locating Buried Tombs and Towns

Most of the first places investigated by the treasure hunters and early archaeologists were clearly visible: big mounds, ruins of cities, and stone monuments. Today, there are ways of finding ancient things that may not be visible at all. Photographs of the ground taken
Line from an aircraft directly overhead can reveal the presence of buried ruins, ancient roads and
5 ditches, or burial mounds that have eroded away to almost nothing. Deep soil is usually thickly covered with vegetation, but soil that is shallow because there is something under it, such as an ancient stone wall, can support only a few plants, and shows up on an aerial photo as a streak that looks very different from everything around it. A slight swelling of a worn-down burial mound may not even be noticeable to a person standing right in front of
10 it, but at sunrise and sunset it will cast a longish shadow that reveals its presence perfectly on a photo taken from above.

The first aerial photographs that produced a major archaeological find were taken over the Sinai Desert in 1920. They showed that several ancient cities were lying beneath the sand! Today, in addition to standard aerial photography, archaeologists make use of special
15 methods. Infrared photography can reveal buried objects. Photography from space can reveal details on the Earth's surface that are not visible at closer distances. It can pick up the course of ancient roads and track them to the sites of buried cities.

There are also tools of modern technology that are helpful in searching for buried tombs and towns from the surface of the ground rather than the air. One of these is ground-
20 penetrating radar, which sends radio waves into the ground. If the waves strike a buried object, they bounce back and form an image on a kind of television screen. Ground-penetrating radar is capable of such things as locating ancient communities that are buried under tons of volcanic ash. Another tool is a device known as a magnetometer. The Earth has a magnetic field all around it, and a magnetometer can measure tiny differences in the
25 field that are caused by such things as buried stone walls and buildings. A magnetometer can detect objects buried as deep as 15 feet (4.5 meters) underground.

1. What did early archaeologists rely on?

(A) Touch

(B) Sound

(C) Sight

(D) Smell

This question asks students to recall explicit information from the beginning of the passage. This information is important because it helps establish the importance of the use of technology by modern archaeologists. While early archaeologists had to rely on their sense of sight to discover artifacts, modern archaeologists have the benefit of technology to help them locate buried ruins and objects. The correct answer, therefore, is (C).

Content Category: Explicit Information / Detail

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2. The passage mentions all of the following technological tools EXCEPT

(A) infrared photography

(B) convection heat

(C) ground-penetrating radar

(D) magnetometer

This question asks students to recall which tools are discussed in the passage and to recognize which tool is not discussed. Convection heat is the one tool that is not mentioned in the passage, so the correct answer to this question is (B).

Content Category: Explicit Information / Detail

3. The passage suggests which of the following about technology?

(A) It has proven to be very useful to archaeologists.

(B) It will eventually replace archaeologists.

(C) It can lead archaeologists to wrong conclusions about ancient peoples.

(D) It cannot replace human instinct.

This question asks students to infer the role of technology in the field of archaeology today. Although (C) and (D) are both plausible options, since they express reasonable concerns people might have about technology, the passage only addresses technology's positive contributions to archaeology. Therefore, (A) is the correct answer.

Content Category: Analysis / Draw Conclusions

---

4. Aerial photographs of the Sinai Desert taken in 1920 revealed for the first time the

(A) beautiful shadows in the desert

(B) plants that grow in the desert

(C) magnetic field around the desert

(D) ruins of cities buried in the desert
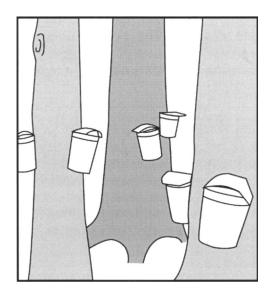
This question asks students to recall information provided in the beginning of the second paragraph. This information is important to the main idea of the passage. The photographs "showed that several ancient cities were lying beneath the sand" (line 13), the first example of technology enabling archaeologists to find ruins not directly visible to the eye. The correct answer, then, is (D).

Content Category: Explicit Information / Detail

5. Which of the following statements is an opinion?

(A) Technology has been helpful in searching for burial sites.

(B) A magnetometer can detect objects buried as deep as 15 feet.

(C) The most valuable finds in the desert are burial mounds.

(D) Photography from space can reveal details on the Earth's surface.

This question asks students to distinguish between factual statements and opinions. Options (B) and (D) are statements of fact taken directly from the passage: (B) from lines 25-26 and (D) from lines 15-16. Option (A), because it does express a judgment, may look like an opinion, but the content of the passage clearly presents as fact the notion that technology has been helpful to archaeologists. Only option (C) offers an opinion that cannot be supported by the passage. Therefore, the correct answer is (C).

Content Category: Inference / Fact or Opinion

Maple Syrup Buckets

At the edge of Mr. Wells' woods
I count eighteen rusty buckets
hanging from maple trees.

Line   In these parts it's a known fact
  5   that Mr. Wells has never smiled
in fact hardly speaks at all

though he once explained to me
why it takes forty gallons of sap
to make a single gallon of syrup

 10   which made me wonder if maybe
he requires forty hours of silence
to make a single hour of talk.

He keeps bees, too: succulent honey.
Strange that such a sour man should
 15   produce all that sweetness.

6. What does Mr. Wells do?

(A) He plants trees.

(B) He makes syrup.

(C) He repairs buckets.

(D) He talks about his bees.

This question asks students to recognize a detail from the poem, namely what Mr. Wells does. According to the poem, Mr. Wells explains to the speaker that "it takes forty gallons of sap to make a single gallon of syrup" (lines 8-9), and the poem ends with the speaker marveling that "such a sour man should produce all that sweetness" (lines 14-15). These details indicate that Mr. Wells makes maple syrup; the correct answer, therefore, is (B).

Content Category: Explicit Information / Detail

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7. According to the poem, which of the following statements about making syrup is true?

(A) It takes forty hours to collect a gallon of sap.

(B) Large amounts of sap are needed to produce a gallon of syrup.

(C) Bees produce a gallon of honey faster than a person can make a gallon of syrup.

(D) Mr. Wells is well known for his unusual methods for making syrup.

In this question, students are to recall basic information contained in the poem. Option (A) might seem correct because of its reference to "forty" and "a gallon of sap"; however, this choice is incorrect because the poem indicates "forty gallons of sap [are needed] to make a single gallon of syrup" (lines 8-9). Option (B) best conveys the notion that a lot of sap is needed to make a small amount of syrup, and therefore (B) is the correct answer.

Content Category: Explicit Information / Detail

8. Which of the following statements most accurately describes Mr. Wells?

(A) Mr. Wells enjoys visitors.

(B) Mr. Wells is talkative.

(C) Mr. Wells works slowly.

(D) Mr. Wells is unpleasant.

The correct answer is (D). This question requires students to infer what type of person Mr. Wells is. The poem indicates that Mr. Wells "has never smiled [and] in fact hardly speaks at all." He is also described as being a "sour man." These descriptions are most indicative of someone who is "unpleasant."

Content Category: Inference / Motives and Behaviors

---

9. According to the poem, what makes the poet certain that Mr. Wells has never smiled?

(A) Mr. Wells told him that he doesn't smile.

(B) Mr. Wells' family volunteered this information.

(C) Other people smile more than Mr. Wells does.

(D) No one living nearby has seen Mr. Wells smile.

To answer this question correctly, students need to draw a conclusion about information mentioned in the poem. Nothing about Mr. Wells' family is mentioned, so option (B) can be eliminated. Option (C) might be true but is also not mentioned or suggested in the poem, and (A) is highly unlikely, since the poem indicates he "hardly speaks at all." Only option (D) most closely reflects the sentiments expressed in the poem.

Content Category: Analysis / Draw Conclusions

Reading Comprehension—Optional Constructed-Response Questions

> **Read Passage 1 to learn more about volcanoes.**
>
> A volcano is a vent, or opening, on Earth's surface where melted rock, called magma, can escape from inside Earth. Magma, a slushy mixture of gases, liquid rock, and minerals, is formed in Earth's interior. Once magma leaves the vent, it is called lava. With its bright colors of yellow, orange, and red, flowing lava often resembles a river of fiery water. Sometimes lava erupts quietly, spilling out of the vent and down the volcano's slope. Other times, pressure from gases forces a glowing spray of lava to shoot out of the vent, creating a lava fountain. Lava fountains usually spout anywhere from a few inches to about 30 feet (9 m) into the air. The highest lava fountain ever recorded on Earth came from Hawaii's Kilauea Volcano in 1959. This amazing fountain soared about 1,900 feet (570 m) into the air. That's several hundred feet higher than the world's tallest building!
>
> Despite our fear of volcanoes' power, some effects of an eruption are beneficial. Air and rain react chemically with lava, producing very rich soil. This can happen in as little time as one year. In Hawaii, Central America, and South America, pineapples and coffee beans — two economically important crops — thrive in the rich volcanic soil.
>
> Also, the heat generated by magma turns groundwater into water vapor. This steam can be used to produce geothermal energy. By drilling into the ground and piping steam or very hot groundwater into power plants, we can produce electricity to light and heat our homes and businesses. New Zealand, Mexico, and the United States are some of the countries that use geothermal power. In Iceland, groundwater is not hot enough to turn into steam, but it is hot enough to pipe directly into homes to heat them.
>
> It's clear that volcanoes not only shape Earth's surface, but they also affect our lives!

1. How does lava look when it erupts? Discuss two examples from the passage.

In order to receive a 2 (the highest score) on this question, the student must show clear and solid understanding of how lava looks when it erupts from a volcano; the response must include at least **two** of the following descriptions from the passage.

- a river of fiery water
- bright colors of yellow, orange, and red
- spilling out of the vent and down the volcano's slope
- glowing spray of lava **or** a lava fountain

In order to receive a score of 1, the student must show basic (but in some way incomplete) understanding of how lava looks when it erupts from a volcano; the response must include **one** of the descriptions listed above.

A score of 0 indicates that the student shows very little or no understanding of how lava looks when it erupts from a volcano; a response in this category includes none of the descriptions listed above or gives only incorrect information.

Content Category: Reading for Understanding

Passage 2 is a fictional account of the eruption of Mount Vesuvius.

In the seaside town of Herculaneum, this summer morning in the year A.D. 79 seemed like any other. On the beachfront, the fishermen pulled up their boats in front of the seawall. Breezes from the bay cooled the wealthy Romans relaxing in the gardens of their elegant summer villas. No one suspected that within hours the top of nearby Mount Vesuvius would blow off, burying the town and many of its people under an enormous avalanche of mud and ash.

Petronia, a servant girl, was busy helping the household prepare for a big party. She had spent the past week shopping, cooking, and cleaning for the special event. By that afternoon, life, as she knew it, was over. Outside, the sky grew very dark, and the air was thick with hot dust that stuck in her throat and made her eyes water. Screaming, pushing crowds on donkeys, horses, even oxen and cows filled the streets.

As Petronia looked back at Mount Vesuvius, her heart almost stopped with fear. The peak of Mount Vesuvius seemed disfigured, as if a giant axe had ripped open the mountain. The mouth of the mountain was outlined in a blaze of red flame, and glowing rocks bubbled out below a gigantic plume of smoke and ash. Petronia turned away from the crowds and escaped to the sea.

The ash and hot gas poured over the town, followed by waves of hot mud. In a few hours, Herculaneum was completely buried under 65 feet of volcanic matter, which, when it cooled, covered the town like a cement shield.

And so the town lay tightly sealed for about 1,500 years.

2. Both the passage about volcanoes and the passage about Mount Vesuvius describe volcanic eruptions. How do these passages differ in their descriptions of the eruptions? Use examples from both passages to support your points.

In order to receive a 2 (the highest score) on this question, the student must show clear and solid understanding of how the two passages differ in their descriptions of volcanic eruptions. The response must indicate that the first passage emphasizes the positive aspects of volcanic eruptions (e.g., color, beauty, dramatic effects, environmental benefits), while the second passage emphasizes the negative aspects of volcanic eruptions (e.g., violence, destruction, frightening appearance). The student must provide specific details from both passages to support claims.

In order to receive a score of 1, the student must show basic (but in some way incomplete) understanding of how the two passages differ; the response might lack specific details **or** might refer only to the descriptions from one passage **or** might describe differences inaccurately or inadequately.

A score of 0 indicates that the student shows very little or no understanding of how the two passages differ; a response in this category includes no correct descriptions or details from either passage.

Content Category: Reading for Understanding

Writing Mechanics

1. Find the punctuation error in the sentence, if there is one.

In cities___ across the United States, childre<u>ns</u>' museums have attracted young people interested
      A   B

in scientific exploration__ and artistic experiences. <u>No error</u>
                          C   D

This question asks students to recognize an error in punctuation. The word *childrens'* should have an apostrophe before the "s" instead of after the "s" to express the possessive case of a collective noun. Therefore, option (B) is the correct answer.

Content Category: Punctuation / Apostrophe

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2. Find the misspelled word, if there is one.

    (A)   soldier

    (B)   separate

    (C)   exagerate

    (D)   no error

This question asks students to identify an incorrectly spelled word. Since the word *exaggerate* is misspelled, the correct answer is option (C).

Content Category: Spelling / Commonly Used Words

3. Choose the word that best completes the sentence.

The children were eating lunch in their backyard _____ it began to rain.

(A)   so

(B)   because

(C)   soon

(D)   when

This question asks students to chose the word that correctly and grammatically establishes the most likely relationship between the two clauses, "The children were eating lunch in their backyard" and "it began to rain." Options (A) and (B) present relationships that don't make sense, while option (C) creates a run-on sentence. Only (D) presents a relationship that both makes sense and creates a grammatically correct expression: The children were eating lunch in the yard <u>when</u> it began to rain.

Content Category: Usage / Diction

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4. Which of the following should be two sentences?

(A)   The emperor glanced in all directions while the flying man soared in the morning wind.

(B)   He saw a farmer watching the sky and noted where the farmer stood.

(C)   The emperor reached out a thin hand to touch the birdlike apparatus.

(D)   I rose in the night and walked to the cliffs far away when the morning breezes blew I gathered my courage.

This question asks students to identify a run-on sentence that should be made into two separatesentences. Options (A) and (B) may appeal to students, since (A) is a complex sentence and (B) has a compound verb. Both (A) and (B) are grammatically correct, however. The only run-on sentence is (D), so (D) is the correct answer.

Content Category: Usage / Sentence Boundaries

Writing Concepts and Skills

1. Decide which is the best order for the sentences listed.

1. The Romans found a way to build the supporting piers of bridges without having to work under water.

2. Once the water inside the poles was pumped out, the workers would climb down and construct a pier of stone using the space inside the poles.

3. First, a circle of long wooden poles with pointed ends was driven into the riverbed.

4. Then the poles were chained together and any gaps were filled with clay.

        (A)   3, 4, 2, 1

        (B)   1, 2, 3, 4

        (C)   1, 3, 4, 2

        (D)   1, 3, 2, 4

This question asks students to put four sentences in order to form a coherent paragraph. Students must be able to recognize the topic sentence and then determine the logical sequence of the remaining sentences. Sentence 1 is the only one broad enough to serve as a topic sentence, and while the topic sentence need not always come first in a paragraph, in this case it is the only one that could logically begin the paragraph. The sequence of the remaining sentences is determined by the adverbs that begin each sentence and the logical order of the actions described. (The poles must be driven into theriverbed and chained together before they can serve as a foundation for a pier.) The correct answer to this question, then, is option (C).

Content Category: Organization / Logical Sequence

2. This is a list of major topics in a report on the life of Harriet Tubman. They are not in the correct order.

1. Growing up on a plantation in the South

2. Working for the Underground Railroad before the Civil War

3. Escaping to the North before the Underground Railroad was established

4. Serving as a nurse, cook, scout, and spy during the Civil War

Which of these shows the topics arranged in the correct order?

        (A)   1, 3, 2, 4

        (B)   2, 1, 4, 3

        (C)   3, 1, 2, 4

        (D)   4, 3, 2, 1

This question asks students to arrange a list of topics for a biographical report in the correct order. Since a biographical report often follows the subject's life chronologically, and since these topics emphasize the time periods during which each activity took place, chronological order seems the most logical choice. Therefore, the student must arrange the topics so that the list begins with Tubman's childhood, continues through the years preceding the Civil War, and concludes with the Civil War period. (A) is the only option that begins with Tubman's childhood and then proceeds chronologically. Thus, (A) is the correct answer.

Content Category: Organization / Logical Sequence

3. Which of these would be the best to use in an essay about a famous scientist's research on marine life?

(A) Rachel Carson was a famous scientist. Her grandmother, a teacher, taught her mathematics.

(B) I am writing a biography of Rachel Carson. She was a scientist who studied nature.

(C) *Silent Spring* is Rachel Carson's best known book. It was one of the first books to expose the dangerous effects of pesticides on the environment.

(D) Rachel Carson began work on *The Sea Around Us* in 1948. She gathered information for the book while on a ten-day voyage on a research boat owned by the Fish and Wildlife Service.

This question asks students to determine which option contains the most appropriate information to include in an essay on Rachel Carson's research on marine life. All of the options discuss Rachel Carson as a scientist; therefore, students must distinguish between interesting statements about Carson and statements that discuss her research on marine life. Only option (D) discusses Carson's marine research, so (D) is the correct answer.

Content Category: Purpose, Audience, and Focus / Relevant Information

4. Choose the opening sentence that goes best with the details in the paragraph.

_____. Glassmakers in Venice, Italy, learned hundreds of years ago to swirl colors through their glass. No two pieces of this glass have exactly the same pattern of colors. Today, Venetian glass is still very popular.

(A) Venice, a city in Italy, is popular for its many canals.

(B) Silica and sand are important materials used in glassmaking.

(C) Glass is used to make eyeglasses, telescopes, and microscopes.

(D) In addition to being useful, Venetian glass is also unique.

This question asks students to choose the best topic sentence for a paragraph on Venetian glass. The best topic sentence will introduce the subject matter that is developed in the paragraph. Although each of the options discusses glass or glass-making, only (D) introduces the idea of the uniqueness of Venetian glass, a key point in the paragraph. Therefore, option (D) is the correct answer.

Content Category: Supporting Details / Topic Sentences

5. The sentence at the beginning of the question is the main idea of a paragraph. Decide which of the choices goes best with the main idea.
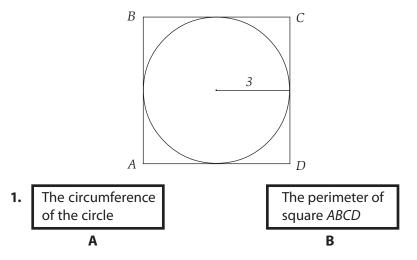
Some jobs in a city are performed by people for no pay.

(A) Citizens volunteer to work in schools and help in nursing homes and hospitals.

(B) Unemployment and homelessness are some of the problems people face in a city.

(C) People often enjoy cultural performances such as symphonies, ballet, and theater.

(D) Trash collection, snow removal, and road maintenance are some of the jobs performed by workers employed by the city.

This question asks students to choose the sentence that provides the appropriate supporting details for the preceding statement. Since the preceding statement refers to jobs in a city that are performed by people for no pay, the correct answer should give examples of these jobs. (A) is the only option that describes volunteer work; therefore, the correct answer is (A).

Content Category: Supporting Details / Relevant Information

Quantitative Reasoning

1.

| The circumference of the circle	The perimeter of square *ABCD*
A	**B**

Which statement is true?

(A)   A is greater than B.

(B)   B is greater than A.

(C)   A and B are equal.

(D)   There is not enough information
     to tell which is greater.

The square "sticks out" more than the circle. If you needed to travel from point *A* around the square and back to *A* again, you could shorten your trip by traveling part of it on the circle. Therefore, the perimeter of the square is greater than the circumference of the circle. This question can also be approached by using the fact that the radius of the circle is 3 and the length of each side of the square is 6.

The circumference of the circle is $2\pi r = 6\pi$ (which is between 18 and 19).

The perimeter of the square is $4 \times 6 = 24$.

Since $24 > 6\pi$, the perimeter is greater than the circumference. Therefore, the amount in B is greater than the amount in A. The correct answer is (B).

Content Category: Comparison

2.

The remainder when 111,111,111 is divided by 3	The remainder when 111,111,111 is divided by 9
A	**B**
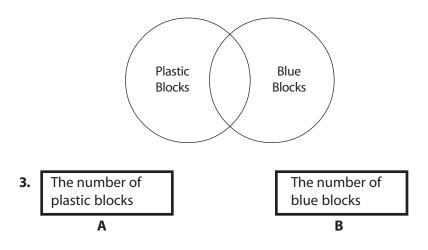
Which statement is true?

(A)   A is greater than B.

(B)   B is greater than A.

(C)   A and B are equal.

(D)   There is not enough information to tell which is greater.

The sum of the digits of 111,111,111 is 9. This means that it is divisible by 9 and also by 3.
The remainder when 111,111,111 is divided by 3 is 0, and the remainder when 111,111,111 is divided by 9 is 0.
Therefore, the remainders in A and B are equal, and the correct answer is choice (C).

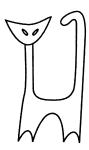Content Category: Extensions and Generalizations

3.

The number of plastic blocks

A

The number of blue blocks

B

Which statement is true?

(A)   A is greater than B.

(B)   B is greater than A.

(C)   A and B are equal.

(D)   There is not enough information
to tell which is greater.

The Venn diagram allows for the possibility that some blocks are plastic and not blue, some are plastic and also are blue, some are not plastic but are blue, and some are neither plastic nor blue. No numbers are given for any of these categories, so there is no way to compare the number of plastic blocks with the number of blue blocks. Therefore, there is not enough information to tell which amount is greater. The correct answer is choice (D).

Content Category: Analysis

4. Scott is using a mirror with the drawing above to form images. Which of the following images can he form?
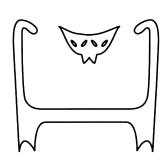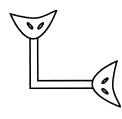
(A)

(B)

(C)

(D)

Among the answer choices, (A) and (D) can be ruled out because they lack symmetry. Choice (A) lacks symmetry because the eyes in the lower part of the image are not a reflection of the eyes in the upper part. Choice (D) lacks symmetry because the two necks are unequal in length. Choice (C) has a vertical line of symmetry, but it is incorrect because a notch appears instead of part of a neck. Choice (B) can be formed by placing an edge of the mirror on a vertical line just to the left of the center of the original drawing. The right-hand side of the image is in the original drawing, and the left-hand side of the image is the reflection in the mirror. The correct answer, therefore, is choice (B).

Content Category: Analysis

Mathematics

Questions 1 - 2 refer to the table below.

TOP TEN GRAMMY
AWARD WINNERS, 1999

Winner	Number of Grammy Awards
Quincy Jones	26
Henry Mancini	20
Stevie Wonder	19
Paul Simon	16
John Williams	16
Aretha Franklin	15
Chet Atkins	14
David Foster	14
Ella Fitzgerald	13
Michael Jackson	13

1. How many of the Grammy award winners shown in the table have won more Grammys than the median number of Grammys won by all 10 winners?

    (A) Three
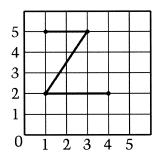
    (B) Four

    (C) Five

    (D) Six

The table lists the Grammy award winners in order from the one with the greatest number of awards to the one with the least number of awards. The median number of Grammys won by all 10 winners is the average of the two middle numbers, 15 and 16; thus, the median is $15\frac{1}{2}$. There are five winners listed who have won more than $15\frac{1}{2}$ awards. The correct answer is choice (C).

Content Category: Statistics / Problem Solving

2. According to the table, what is the range in the number of Grammys awarded?

(A) 7

(B) 9

(C) 11

(D) 13

The range refers to the difference between the highest value and the lowest value. For the data in the table, the highest number of Grammys awarded is 26 and the lowest number of Grammys awarded is 13. Therefore, the range is 26 — 13, which is 13. The correct answer is choice (D).

Content Category: Statistics / Problem Solving

3. The four points with coordinates (1, 2), (1, 5), (3, 5), and (4, 2) are to be connected to make a Z as shown. In what order can they be connected?

(A) (1, 2) (1, 5) (3, 5) (4, 2)

(B) (1, 5) (3, 5) (1, 2) (4, 2)

(C) (3, 5) (1, 5) (1, 2) (4, 2)

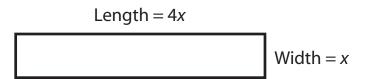(D) (4, 2) (3, 5) (1, 5) (1, 2)

To connect the four points, you would begin either at (1, 5), the point at the upper left of the Z, or at (4, 2), the point at the lower right of the Z. If you begin at (1, 5), the next point should be the one to the right of (1, 5), namely (3, 5). The point after that should be the one on the lower left, (1,2), and the last point should be to the right of (1,2), namely (4, 2). This is the sequence shown in answer choice (B), which is the correct answer. Answer choice (D) begins with (4, 2). If you started at (4, 2), the next point should have been (1, 2). In option (D) the first point listed is (4, 2), and the second is (3, 5). So option (D) is not correct.

Content Category: Geometry and Spatial Sense / Conceptual Understanding

4. Five consecutive whole numbers sum to 125. What are the numbers?

(A) 18, 19, 20, 21, and 22

(B) 21, 22, 23, 24, and 25

(C) 23, 24, 25, 26, and 27

(D) 25, 26, 27, 28, and 29

The middle number of the five consecutive whole numbers is also the average of the five consecutive whole numbers. That middle number is 125 ÷ 5, which is 25. To make 25 the middle number, you would start with 23. The five numbers are 23, 24, 25, 26, and 27. An alternate approach is to add up the five numbers in any option and see if the sum is 125. The only option containing 5 numbers with a sum of 125 is option (C). The correct answer is choice (C).

Content Category: Number Systems and Number Theory / Problem Solving

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$$\text{Length} = 4x$$

Width $= x$

5. The length of a rectangular garden is four times its width. The perimeter of the garden is 240 meters. What is the length of the garden?

(A) 24 meters

(B) 48 meters

(C) 96 meters

(D) 192 meters

Using the information about the rectangle's dimensions and perimeter, you can write the equation $4x + x + 4x + x = 240$. Since $10x = 240$, it follows that $x = 24$. The question asks for the length of the garden, $4x$, which is 4 x 24 or 96. The correct answer is choice (C).
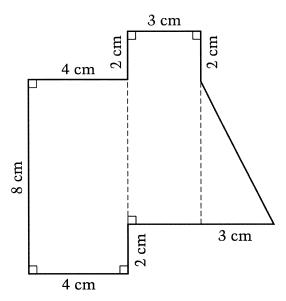
Content Category: Measurement / Problem Solving

6. A number cube has a different number from 1 to 6 on each face. If the number cube will be rolled twice, what is the probability that the sum of the numbers on the top face of the cube will be 10 ?

(A) $1/12$

(B) $1/10$

(C) $1/6$

(D) $2/3$

There are 36 combinations that result from rolling the cube twice. You need to count the number of combinations for which the sum of the numbers on the top face is 10.

1st roll	2nd roll
4	6
5	5
6	4

There are 3 combinations giving a sum of 10. Therefore, the probability that the sum will be 10 is 3 out of 36, or $1/12$. The correct answer is choice (A).

Content Category: Probability / Problem Solving

7. What is the area of the figure above?

    (A) 74 square centimeters

    (B) 68 square centimeters

    (C) 65 square centimeters

    (D) 49 square centimeters

The figure consists of two rectangles and a triangle. One rectangle has dimensions 4 cm by 8 cm. Therefore, its area is 32 square centimeters. The other rectangle has dimensions 3 cm by 8 cm. The length of 8 cm is found by comparison with the length of the first rectangle. The second rectangle extends 2 cm further on the upper end, but starts 2 cm higher on the lower end, $8 + 2 - 2 = 8$. Therefore, the area of the second rectangle is 24 square centimeters.

The triangle has base 3 cm and height 6 cm ($8 - 2 = 6$). The area of the triangle is $^1/_2 \times 3 \times 6$, which is 9 square centimeters.
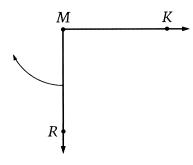
Therefore, the total area is $32 + 24 + 9$, or 65 square centimeters. The correct answer is choice (C).

Content Category: Measurement / Problem Solving

8. Which of the following could not be a rectangle?

    (A)   A parallelogram

    (B)   A polygon

    (C)   A trapezoid

    (D)   A quadrilateral

A parallelogram could be a rectangle (if it happened to have right angles). A polygon could be a rectangle (if it happened to have four sides and four right angles). A quadrilateral could be a rectangle (if it happened to have four right angles). The reason a trapezoid can never be a rectangle is that a trapezoid must have one pair of opposite parallel sides and one pair of opposite nonparallel sides. In a rectangle, both pairs of opposite sides are parallel. The correct answer is choice (C).

Content Category: Geometry / Conceptual Understanding

9. Ray *MR* above moves around point *M* in a clockwise direction until it is on top of ray *MK*. How many degrees does ray *MR* move?

    (A)   90°

    (B)   180°

    (C)   270°

    (D)   360°

Ray *MR* will move through three quarter circles. The first quarter circle will result in the ray opposite ray *MK*. The second quarter circle will result in the ray opposite the initial position of ray *MR*. The third quarter circle will result in a ray on top of ray *MK*. Each quarter circle measures 90°, and 3 x 90 = 270°. The correct answer is choice (C).

Content Category: Measurement / Conceptual Understanding

10. Which of the following is less than $7/8$?

(A) $9/10$

(B) $8/9$

(C) $3/4$

(D) $15/16$

The fraction $7/8$ is $1/8$ less than 1.

The fraction $9/10$ is $1/10$ less than 1.

Since $1/10$ is less than $1/8$, it follows that $9/10$ is closer to 1 than $7/8$ is.

Therefore, $7/8 < 9/10$.

Similar thinking will show that $7/8 < 8/9$ and $7/8 < 15/16$.

Alternatively, to compare $7/8$ with $3/4$, rewrite $3/4$ as $6/8$.

It is clear that $6/8 < 7/8$. Therefore, $3/4 < 7/8$.

The correct answer is choice (C).

Content Category: Numbers and Number Relationships / Conceptual Understanding

141

Mathematics - Optional Constructed-Response Questions

1. Here are some clues about a certain whole number.

- It is a multiple of 3.
- Its square is an even number less than 100.

What is the number?

Explain your reasoning.

It is given that the number is a multiple of 3, and its square is an even number less than 100. The even squares less that 100 are 4, 16, 36, and 64. The square roots of these squares are 2, 4, 6, and 8. Of these square roots, only 6 is a multiple of 3, so 6 is the only positive integer that satisfies both conditions. Alternative solutions are possible. Students receive full credit (a score of 2) if they answer 6 and have a mathematically correct explanation. Students receive partial credit (a score of 1) by

1) answering 6 with an incomplete explanation or no explanation

OR

2) answering 36 with an explanation that includes $6^2 = 36$ and $36 < 100$.

Content Category: Math Communication

2. Each day Mrs. Kistler drives 48 miles to work and 48 miles back home again.

- Her car uses 1 gallon of gas for every 30 miles she travels.
- Last week she worked 5 days.

How many gallons of gas did she use last week going to work and back?

Show your work or explain how got your answer.

Mrs. Kistler drives 96 miles each day. In the 5 days she worked last week her total mileage is 5 x 96 or 480 miles. Her car uses 1 gallon of gas for every 30 miles. $480 \div 30 = 16$. The correct answer is 16 gallons.

Alternative approaches are possible. For example, Mrs. Kistler drives 96 miles each day. Since $96 \div 30 = 3.2$, she uses 3.2 gallons of gas each day. Over the course of 5 days she uses 32 x 5 or 16 gallons of gas.

Students receive full credit (a score of 2) if they answer 16 gallons and show mathematically correct work or explanation.

Students receive partial credit (a score of 1) if they

      1) give the correct answer with no work or incomplete/unclear work

              OR

      2) have the correct process, but do not get the correct answer

              OR

      3) answer 8 gallons and show work for only the one-way journey instead of the round-trip journey.

Content Category: Math Communication

Sample Questions, Levels 7-10

Verbal Reasoning

1. Which lettered pair of words goes together in the same way as the first pair of words?

MELODIOUS : SOUND ::

(A)   peaceful : noise

(B)   evident : view

(C)   tasty : flavor

(D)   malodorous : smell

The correct answer to this reasoning problem is (C). There is a positive, associational relationship between the two terms in the pair: a sound that is melodious is by definition pleasing. Only the pair of words in option (C) has this same relationship.

Content Category: Analogical Reasoning

| Vital |
| Central |
| Fundamental |

2. Which of the following words best fits in the list above?

(A)   Bothersome

(B)   Basic

(C)   Stray

(D)   Initial

The correct answer to this question is (B). Each of the three words in the list defines something that is "essential or of primary concern." Only option (B) conveys this same meaning.

Content Category: Categorical Reasoning / Fit

3. Complete the statement below by selecting the most logical conclusion.

If all mammals are warm-blooded creatures and if all bears are mammals, then

(A) bears hibernate because they are warm-blooded creatures

(B) every warm-blooded mammal is a bear

(C) grizzly bears are warm-blooded creatures

(D) full-grown grizzly bears are the largest warm-blooded creatures

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The correct answer to this question is (C). The suppositional statement establishes two points: 1) all mammals are warm-blooded creatures, and 2) all bears are mammals. Given this information, only option (C) can be deduced from the information provided.

Content Category: Logical Reasoning / Deductive

Vocabulary

1. The sales representative had traveled the same <u>circuit</u> throughout the southeastern United States for twenty years before retiring.

Which of the following definitions of the word "circuit" is used in the sentence above?

(A) Periphery

(B) Route

(C) Assemblage

(D) League

This question asks students to choose the correct definition of the word "circuit" in the context of a sentence. One meaning of "circuit" is the line going around or bounding any area or object, making option (A) attractive, but "periphery" does not make sense within the context of the sentence. The only option that makes sense in this context is (B), "route," which matches the definition of a circuit as the route followed on a periodical journey made to perform certain duties. Therefore, option (B) is the correct answer.

Content Category: Application

2. Choose the word that best fist in the context of the sentences.

The talk show host's popularity was based on her ability to generate _____ dialogue with her guests. The witty conversation ensured high ratings with a large audience.

(A) onerous

(B) listless

(C) scintillating

(D) mundane

This question asks students to choose the word that best fits in the context of these sentences. Since the sentences discuss the host's popularity and witty conversation with her guests, the missing word should emphasize the lively quality of the dialogue. The word "scintillating," meaning animated and vivacious, is the only one of the choices that emphasizes this quality, so option (C) is the correct answer.

Content Category: Precision

3. Choose the pair of words that best fits in the context of the sentence.

Although Ron disagreed with his friend, instead of _____ him directly, Ron tried to express his own idea more _____.

(A) supporting . . secretly

(B) contradicting . . diplomatically

(C) attacking . . meekly

(D) affirming . . reliably

The pair of words that makes the most sense in this sentence is the pair in option (B): contradicting . . diplomatically. Options (A) and (D) can be eliminated based on the first word in each pair; the first blank can be filled logically only by something that reinforces the idea that Ron is in disagreement with his friend. Option (C) is plausible at first glance, but "attacking" is too strong — disagreement does not necessarily imply antagonism — and the opposition between "attacking" and expressing an idea "meekly" is not as precise as the more logical opposition between "contradicting" and expressing an idea "diplomatically."

Content Category: Precision

Reading Comprehension

> ## The World of the Amazon Jungle
>
> When you are inside the jungle of the Amazon, away from the river, the trees vault out of sight. It is hard to remember to look up the long trunks and see the fans, strips, fronds, and sprays of glossy leaves. Inside the jungle you are more likely to notice the snarl of
> *Line* climbers and creepers around the trees' trunks, the flowering bromeliads and epiphytes in
> 5 every bough's crook, and the fantastic silk-cotton tree trunks 30 or 40 feet across, trunks buttressed in flanges of wood whose curves can make three high walls of a room— a shady, loamy-aired room where you would gladly live. Butterflies, iridescent blue, striped, or clear-winged, thread the jungle paths at eye level. And at your feet is a path of ants bearing triangular bits of green leaf. The ants with their leaves look like a wide fleet of sailing
> 10 boats — but they don't quit. In either direction they wobble over the jungle floor as far as the eye can see.
>
> Unseen in the jungle, but present, are tapirs, jaguars, many species of snake and lizard, ocelots, armadillos, marmosets, howler monkeys, toucans and macaws, and a hundred other birds, deer, and bats. Also present in this jungle, but variously distant, are oil derricks and
> 15 pipelines, and some of the fiercest fighters in the world.

1. The main idea of the passage is that

(A) the jungle teems with more life than meets the eye

(B) danger lurks in unseen places

(C) the beauty of the jungle is best appreciated from the river

(D) one must remember to look up when inside the jungle

This question asks the students to recognize the main idea of the passage. The passage's detailed description of the various plants, animals, and activities in the Amazon jungle clearly supports (A) as the correct answer.

Content Category: Explicit Information / Main Idea

2. The author's attitude toward being in the jungle is primarily one of

    (A) mild discomfort

    (B) scholarly interest

    (C) anxiety

    (D) awe

From information stated in the passage, the students are to determine the author's overall attitude toward the jungle. Nothing in the passage suggests that the author is uncomfortable or anxious about being in the jungle; therefore, (A) and (C) can be easily eliminated. (B) might hold some appeal, but the author does not discuss the jungle in a scholarly manner. Instead, the author conveys the wonder of being in the presence of jungle with its teeming life; therefore, (D) is the correct answer.

Content Category: Analysis / Style and Tone

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3. The description of the trees mainly emphasizes that they are

    (A) endangered

    (B) useful to humans

    (C) very large

    (D) covered with animal life

This question requires students to use their skills of analysis. Based on the description of the trees in the passage, students are to determine which aspect of the trees the author emphasizes. Options (A) and (B) are the easiest to eliminate, for although the trees may well be both endangered and useful to humans, these aspects are not mentioned in the passage. Option (D) is appealing, but the only life mentioned in the passage that is directly supported by the trees is plant life: the "climbers and creepers" around the trees' trunks and the "bromeliads and epiphytes" in their boughs (lines 4-5). The emphasis in the passage is clearly on the size of the trees. The trees are described as "vault[ing] out of sight" (lines 1-2), with "long trunks" (line 2) that are "30 or 40 feet across" (line 5). Option (C) is therefore the correct answer.

Content Category: Analysis / Purpose and Intent

4. The phrase "they don't quit" (line 10) suggests all of the following about the ants EXCEPT:

(A) They seem almost infinite in number.

(B) They are extremely flexible.

(C) They do not stop moving.

(D) They travel great distances.

This question requires students to understand the phrase "they don't quit" (line 10) in the context of the passage and to recognize what is not discussed, either explicitly or implicitly, about the ants. Options (A), (C), and (D) are all mentioned or implied. Nothing in the passage, however, suggests that the ants are "flexible"; therefore, the correct answer is (B).

Content Category: Inference / Draw Conclusions

5. The descriptions in the passage rely primarily on the sense of

(A) smell

(B) sound

(C) sight

(D) touch

This question asks students to recognize which sense the author appeals to most in describing the Amazon jungle. The detailed descriptions of the trees' height and size, the various flowering plants, and the colorful insects appeal most to the reader's sense of sight. Option (C), therefore, is the correct answer.

Content Category: Analysis / Purpose and Intent

6. The second paragraph of the passage primarily serves to

(A) describe the dominance of machinery over nature

(B) reemphasize the need for conservation

(C) provide a contrast between plant and insect life and human life

(D) introduce the presence of larger creatures and human beings

---

In this question, the students are to examine the second paragraph only and determine its purpose. Why has the author included this information? In this paragraph, the author mentions other species of animals that are much larger than the butterflies and ants mentioned earlier. Also, the paragraph includes references to the "oil derricks and pipelines, and some of the fiercest fighters in the world" (lines 14-15), which are clearly allusions to the presence of humans. Therefore, (D) is the correct answer.

Content Category: Analysis / Purpose and Intent

Questions 7-11 are based on the following passage.

Although we all use postage stamps, few of us think about their origin. Read this account to learn about their early development.

Before the postage stamp, there was the postmark. In England, it took the form of a triangular impression in red ink bearing the words "Penny post paid." From 1834 to 1838 an Englishman by the name of Chalmers, a printer and bookseller in Dundee, printed a

Line kind of postage label that he had invented. But the real father of the postage stamp was
5 Roland Hill. In 1837 he published a pamphlet entitled *Post Office Reform* in which he proposed that letters be carried any distance within Great Britain and Ireland for a fixed rate and that all postage be prepaid. (At the time, most letters went through the mail unpaid, with postage collected on delivery.) Wrappers and envelopes with the postmark indicating prepayment were to be sold at all post offices; and for people who wanted to use
10 their own stationery, Hill proposed a bit of paper just large enough to bear the post office's imprint and "covered at the back with a glutinous wash, which might, by applying a little moisture, attach to the back of the letter."

Hill's proposal was submitted to the Houses of Parliament, where at first it met great resistance. Thanks to publicity generated by the press, however, Hill was able to work out
15 the details of his proposal to everyone's satisfaction. On August 17, 1839, a law was passed authorizing the use of the adhesive postage stamp, and a competition was held. The subject chosen for the stamp was Queen Victoria. Henry Courbould made a drawing from a portrait that had been used by the royal mint for the medal that had been struck commemorating the queen's first visit to London in 1837. Above the head of the queen was the word
20 "Postage," and below, a panel with "One Penny" or "Two Penny." On May 6, 1840, both stamps were ready: the one-penny was black, the two-penny blue.

The following year, these stamps were sold in every post office in Great Britain. The postage stamp was enthusiastically adopted by the British public: in 1839, 50 million letters were sent within the country; in 1840, 170 million; and ten years later, more than
25 double that number!

The celebrated one-penny black and its companion, the two-penny blue, are now among the rarest stamps in the world and the prize of any collection.

7. According to the passage, the triangle of red ink was known as the

(A) postage stamp

(B) postmark

(C) postal label

(D) postal wrapper

This question asks students to recall explicit information from the first sentence of the passage. The first sentence indicates that the postage stamp was preceded by the postmark, which was "a triangular impression in red ink" (line 2). Therefore, the correct answer is option (B).

Content Category: Explicit Information / Detail

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8. The term "glutinous wash" (line 11) refers to the

(A) ink used to print the stamps

(B) paper the stamps were made of

(C) coating on the back of the stamps

(D) liquid used in paper manufacture

This question asks students to infer what the term "glutinous wash" refers to in this passage. The passage describes a small bit of paper covered with a glutinous wash on the back (lines 10-11). The paper is then attached to a letter after a little moisture is added to the glutinous wash. The student must infer that the bit of paper is a stamp and that the "wash" is the glue that coats the back of a stamp. The correct answer to this question, then, is (C).

Content Category: Inference / Implicit Information

9. The passage suggests that which of the following helped Hill's proposal gain acceptance in Parliament?

(A) The press

(B) The enthusiasm of the queen

(C) Henry Courbould

(D) Intense pressure from the post office

This question asks students to determine which factor helped Hill's proposal gain acceptance in Parliament. The passage states that "Thanks to publicity generated by the press ... Hill was able to work out the details of his proposal to everyone's satisfaction" (lines 14-15). Nothing else is cited as a factor in helping Hill's proposal gain Parliament's approval. Option (A), therefore, is the correct answer.

Content Category: Inference / Implicit Information

10. The passage implies that which of the following happened in 1840?

(A) Parliament was still debating Hill's proposal.

(B) The queen's portrait for the first stamp was painted.

(C) Stamps were phased into circulation.

(D) Collectors rushed to buy the rare stamps.

This question asks students to infer what happened in 1840. The student needs to recognize a logical sequence of events in order to answer this question correctly. Options (A) and (B) refer to events that took place before 1840. Option (D) refers to an event that would not yet have happened in 1840. Only option (C) describes an event that would logically have taken place in 1840: if the stamps were ready on May 6, 1840, then it is likely that they were phased into circulation shortly thereafter. Moreover, the passage states that by "the following year [1841], these stamps were sold in every post office in Great Britain." The stamps must therefore have been phased into circulation n 1840. Option (C) is the correct answer.

Content Category: Inference / Draw Conclusions

11. The passage mentions the numbers of letters sent within Great Britain in order to indicate that

(A) people enthusiastically accepted the postage stamps

(B) stamps were cheaper than postmarks

(C) people corresponded more than they do today

(D) mail delivery was much faster after stamps were introduced

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This question asks students to infer the reason for the references in the passage to the numbers of letters sent within Great Britain after stamps were introduced. In answering this question, the student should take note of where these references occur in the passage. Options (B), (C), and (D) are plausible reasons for an increase in the number of letters sent, but the information needed to support these statements is not in the passage. Option (A) makes the most sense in the context of the passage, especially since the references to the numbers of letters immediately follow the statement "the postage stamp was enthusiastically adopted by the British public." Clearly, the passage cites the numbers of letters sent in order to show the British public's enthusiasm for the stamp. Option (A), then, is the correct answer.

Content Category: Analysis / Purpose and Intent

Reading Comprehension — Optional Constructed-Response Questions

Passage 1 is a story drawn from legends of King Arthur and his knights.

When the knights of the Round Table met at Camelot, there rode into the hall a fair lady who went straight to King Arthur and greeted him, saying, "Where is Sir Lancelot?" And the king showed her. Then went she to him and said, "Sir, come with me into the forest." Lancelot and the lady rode forth, and she led him to a youth so fair and well-made that in all the world none could find his match. His name was Galahad, and Lancelot thought that he had never beheld a better man.

"Sir," said the lady, "make this youth a knight, for from no worthier hand than Lancelot's can he receive that honor." Galahad expressed the same desire. So Lancelot knighted him.

Then Lancelot returned to Camelot. When the knights next gathered in the banquet hall, each found his name written at a seat in letters of gold. And in "the Perilous Seat," the place of honor at the table, a name was also written, and they marveled greatly, for there had never been a name there and no knight had ever yet dared to sit upon that seat. Lancelot covered the name with a silken veil.

When the high feast began, the hall was filled with laughter and talk. But suddenly the doors and windows shut violently all by themselves, making thick darkness, and a fair, gentle light came from the Perilous Seat. Then Arthur rose and said, "Fair knights, rejoice, for I know we shall today see him who may sit in the Perilous Seat."

Then an old man entered, leading young Galahad. The old man took him to the Perilous Seat, and lifting up the silken cloth that had covered the name, read these words: "This is the seat of Sir Galahad, the good knight."

Galahad was taken to a mighty stone that floated in the river and was pierced by a sword inscribed thus: "No man shall take me but the best knight in the world."

"Here," said the king, "is as great a marvel as ever I saw, and many good knights have tried and failed to gain that sword."

"I do not wonder," said Galahad, "for this adventure is mine, since I brought no sword with me." And he laid his hand upon the sword and lightly drew it from the floating stone.

1. In Passage 1, what elements seem to indicate that Galahad was destined to sit in the Perilous Seat, the seat of honor? Discuss at least two of these elements.

To receive a 2 (the highest score) on this question, the student must show clear and solid understanding of two or more elements that indicate that Galahad was destined to sit in the seat of honor; the student must name two or more of the following.

- fair
- noble
- well-made
- no better man beheld by Lancelot
- no match in the world
- knighted by Lancelot
- lady wanted him knighted
- name written on the Perilous Seat
- place of honor
- light comes from seat
- doors and windows close
- can draw sword from stone

To receive a score of 1, the student must show basic (but in some way incomplete) understanding of elements; the student must name one the elements listed above.

A score of 0 indicates that the student shows very little or no understanding of the elements that indicate that Galahad was destined to sit in the seat of honor; the student is unable to name any of the elements listed above or lists elements but they are incorrect.

Content Category: Reading for Understanding

Passage 2 considers the legend of King Arthur from a historian's point of view.

In England archaeologists wonder: did the legendary King Arthur really exist, or were he and his knights just a storybook tale? A twelfth-century English monk, Geoffrey of Monmouth, wrote a History of the Kings of Britain that claims that the Arthurian stories came from old books and legends, but the tales he recorded were true and set in Arthur's time. Many people, however, scoffed, saying that Geoffrey made up the entire legend.

The tales about Arthur, featuring castles, dragons, sorcerers, and knights in armor, have constituted the principal myth of Britain for nearly a thousand years. Some archaeologists think that the stories are based on the real deeds of a great warrior (not King Arthur) who lived at the end of the fifth century A.D. when the Roman Empire had collapsed and Anglo-Saxons from Europe invaded England. All the kings in Britain joined forces to defeat the invaders, and the battles became the subject of stories passed down through time. Arthur's legends became linked with those of the unknown leader of these battles, and Arthur's fame grew. Geoffrey of Monmouth tells that Arthur was born at Tintagel in Cornwall, England, and archaeological digs at Tintagel have unearthed luxurious objects, suggesting that the site was someone's royal stronghold. But whose?

The stories also tell how Arthur was wounded in his last battle and taken to the enchanted Isle of Avalon, where he died and was buried. No one really knows Avalon's location, but in the twelfth century, monks at Glastonbury in England announced that they had unearthed a burial place with the Latin words: "Here lies the renowned King Arthur in the Isle of Avalon." Beneath the inscription was an oak coffin containing bones and a skull. The medieval description suggests that the tomb could have been a royal grave. Was the tomb Arthur's?

Archaeologists may never find complete evidence that Arthur really existed. But as long as people can read the wonderful Arthurian legends, he and his brave knights seem very real.

2. What does the last paragraph of Passage 2 make you think about the relationship between Passage 1 and Passage 2?

To receive a 2 (the highest score) on this question, the student must show clear and solid understanding that, although there is no definitive proof that Arthur ever existed, the story and the people are realistic, or the story is valuable, or the story is enjoyable. The student must counterpose the lack of definitive proof to the value or interest or realism of the story; he or she may say, for instance, "Although there is no proof or there may never be proof, the story or the people in the story are realistic (or there is value in the story, or enjoyment in the story, or the story is exciting or fun)."

To receive a score of 1, the student must show basic (but in some way incomplete) understanding of the relationship between Passages 1 and 2; the student may give either half of the response described above, but not both halves.

A score of 0 indicates that the student shows very little or no understanding of the relationship between Passages 1 and 2; a response in this category gives none of the response described above or give an incorrect response.

Content Category: Reading for Understanding

Writing Mechanics

1. Find the error in the sentence, if there is one.

Even though__ Simon was tired ; he found the energy to take a long__ bike ride after school.
          A   B   C

No error
  D

The correct answer to this question is (B). Students must identify the punctuation error in the sentence by recognizing that the semicolon should be replaced with a comma, since "Even though Simon was tired" is a subordinate clause, not an independent one.

Content Category: Punctuation / Comma versus Semicolon

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2. Find the error in the sentence, if there is one.

"All atheletes need to turn in their uniforms by Friday," announced the coach. No error
          A   B   C   D

The correct answer to this question is (A). Students are to recognize that "athletes" is misspelled.

Content Category: Spelling / Commonly Used Words

3. Find the error in the sentence, if there is one.

The lyrics of one of the <u>most - known</u> spirituals, "Swing Low, Sweet Chariot," <u>are</u> repeated
                             A   B

several times in order <u>to produce</u> a melancholy theme. <u>No error</u>
                                C   D

The correct answer to this question is (A). This usage question tests appropriate diction. Students are to recognize that the correct word choice for (A) should be either "best-known" or "most widely known."

Content Category: Usage / Diction

Writing Concepts and Skills

1. Which of the following sentences would be most appropriate to include in a report on proper nutrition?

    (A)   Fruits and vegetables grow better in warmer areas of the country.

    (B)   Fruits and vegetables provide important vitamins and minerals needed for optimal body function.

    (C)   The federal government regulates meat, poultry, and dairy products.

    (D)   Fast-food restaurants sell more meat products than fruits and vegetables.

This question asks students to determine which sentence provides the appropriate information for a report on proper nutrition. All of the options make reference to foods that most people view as healthful, but only option (B) discusses the nutritional value of foods. Therefore, the correct answer is (B).

Content Category: Purpose, Audience, and Focus / Relevant Information

2. This is a list of the major topics in an article about how to redecorate a room.

    1.   Buy paint and other materials.

    2.   Decide on a color scheme.

    3.   List what you will need to buy.

    4.   Comparison shop for the lowest prices.

Which of the following shows the parts of this outline arranged in the correct order?

    (A)   2, 1, 3, 4

    (B)   2, 3, 4, 1

    (C)   3, 4, 2, 1

    (D)   4, 3, 1, 2

This question asks students to arrange a list of topics for an article about redecorating a room. The topics should be arranged in a logical sequence of actions, beginning with planning the redecoration and ending with purchasing the necessary materials. Although both options (A) and (B) begin with the initial planning, only (B) proceeds logically from that point. Therefore, (B) is the correct answer.

Content Category: Organization / Logical Sequence

3. Decide which is the best order for the sentences listed.

1. The pilot and a picked crew go out in a smaller "sounding-boat" and hunt for the best water.

2. The pilot sounds the depth of the river with a pole that is ten or twelve feet long.

3. The moment the shallowest point is reached, the pilot delivers the order, "Let go the buoy!" and over it goes.

4. This is the way that a river "sounding" is done.

        (A)   1, 3, 2, 4

        (B)   2, 3, 4, 1

        (C)   3, 2, 1, 4

        (D)   4, 1, 2, 3

This question asks students to put four sentences in order to form a coherent paragraph. Students must be able to recognize the topic sentence and then determine the logical order of the remaining sentences. The fourth sentence is the only sentence broad enough to serve as a topic sentence, and while the topic sentence need not always come first in a paragraph, in this case it is the only one that could logically begin the paragraph. The order of the remaining sentences is determined by the logical sequence of the actions described. (The pilot and crew must first go out in a boat, then use a pole to sound the depths, and finally, drop the buoy when the shallowest point is found.) The correct answer to this question, then, is option (D).

Content Category: Organization / Logical Sequence

4. Choose the opening sentence that goes best with the details in the paragraph.

_____. New York surpassed Philadelphia not because of the superiority of its climate but because of the superiority of its harbor. It offered unimpeded access up the Hudson River. The city's natural setting was a blessing occasionally mentioned in a patriotic address, though there was little knowledge of the natural processes that had led to the formation of the solid material on which the city's streets were built.

(A) Traces of the past in New York City are buried and hidden.

(B) The geography of New York City was the city's supreme advantage.

(C) The reasons that the Dutch first came to New York City were largely commercial.

(D) Most of New York City was covered by the great Laurentide glacier about 20,000 years ago.

This question asks students to choose the best topic sentence for a paragraph on New York City's natural resources in its early years. The best topic sentence will introduce the subject matter that is developed in the paragraph. Although each of the options discusses an aspect of New York City's past, only option (B) discusses the advantageousness of New York City's geography, the main subject of the paragraph. The correct answer, then, is (B).

Content Category: Supporting Details / Topic Sentences

5. The sentence at the beginning of the question is the main idea of a paragraph. Decide which of the choices goes best with the main idea.

Past Presidents have led the country through wars, economics depressions, and periods of geographic expansion.

(A) To be successful, Presidents need various leadership skills and the ability to deal with enormous national challenges.

(B) Wars are devastating to a nation.

(C) In order to be President, one must be a United States citizen.

(D) Some Presidents were senators, representatives, or governors before taking office.

This question asks students to choose the sentence that is supported by the details in the preceding statement. Since the preceding statement refers to some of the weighty responsibilities of past Presidents, the correct answer will most likely discuss the general skills that Presidents need to have. Options (C) and (D) are accurate statements, but they aren't sufficiently related to the preceding statement. Option (B) is a reasonable statement but has little to do with the preceding statement. Only option (A) discusses the skills that Presidents need to lead their nations through difficult periods. Therefore, (A) is the correct answer.

Content Category: Supporting Details / Relevant Information

Quantitative Reasoning

For Question 1: Choose:

(A) if the quantity in Column A is greater,

(B) if the quantity in Column B is greater,

(C) if the two quantities are equal,

(D) if not enough information is given for you to decide.

Column A	Column B

A car traveled m miles. The average speed of the car, in miles per hour, was x; and the average speed of the car, in miles per minute, was y.

1.

x	y

The car's average speed is given as x miles per hour or y miles per minute. Since 1 hour = 60 minutes, a speed of x miles per hour is equivalent to $\frac{x \text{ miles}}{60 \text{ minutes}}$ or $\frac{x}{60}$ miles per minute. Since the car's average speed is y miles per minute, $y = \frac{x}{60}$. Since $x > \frac{x}{60}$, x must also be greater than y. Thus, the correct answer is choice (A).

It is also possible to reason that the correct answer must be (A) because a car would go farther in 1 hour than it would go in 1 minute.

Content Category: Analysis

For Question 2: Choose:

(A) if the quantity in Column A is greater,

(B) if the quantity in Column B is greater,

(C) if the two quantities are equal,

(D) if not enough information is given for you to decide.

Column A	Column B

p is an integer and 7 x p is even.

2.

The remainder when p is divided by 2.	1

It is given that $7 \times p$ is even, which means that it has 2 as one of its factors. The factor 2 is not in the 7 (since 7 is odd), so it must be in the integer p. This means that p is even. Therefore, when p is divided by 2, the remainder is 0. Since 0 is less than 1, the amount in column B is greater than the amount in column A. The correct answer is choice (B).

Content Category: Extensions and Generalizations

3. If $a \triangle b = a(a - b)$ and $a \odot b = b(b + a)$, what is the value of $(8 \triangle 5) + (8 \odot 5)$?

    (A)   21

    (B)   29

    (C)   89

    (D)   128

This question introduces two newly defined operations, $\triangle$ and $\odot$. Students are not expected to have seen these operations before, since the operations were made up for this question.

Since $a \triangle b = a(a - b)$,
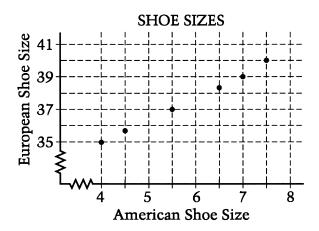$8 \triangle 5 = 8(8 - 5) = 8 \times 3 = 24$

Since $a \odot b = b(b + a)$,
$8 \odot 5 = 5(5 + 8) = 5 \times 13 = 65$

The sum is $24 + 65$, which equals 89. The correct answer is choice (C).

Content Category: Analysis

Mathematics

SHOE SIZES

1. The graph above shows the relationship between some American and European shoe sizes. Based on the graph, which of the following is the range of European sizes that would include the American size 9?

(A)   35 to 37

(B)   38 to 40

(C)   41 to 43

(D)   44 to 46

On the graph, American shoe sizes are given on the horizontal axis and European shoe sizes are given on the vertical axis. The six points in the body of the graph give six correspondences between American and European sizes. For example, an American size of 4 corresponds to a European size of 35. The six points appear to lie approximately on a line. Noticing this pattern allows you to approximate other correspondences, by filling in or extending the line. The line can be extended up and to the right, to see that an American size 9 appears to correspond to a European size of about 42. This lies in the range 41 to 43. The correct answer is choice (C).

Content Categories: Pre-Algebra / Problem Solving

2. It takes light 0.000000001 second to travel 30 centimeters. What is this number of seconds written in scientific notation?

(A) 1.0×10^{9}

(B) 1.0×10^{8}

(C) 1.0×10^{-8}

(D) 1.0×10^{-9}

The problem here is to transform the number 0.000000001 to a number in the form 1.0×10^{n}, where n is an integer. The number 1.0 is 1,000,000,000 (or 10^{9}) times 0.000000001. The 9 in 10^{9} can be found by counting the number of decimal places to the right of the decimal point. (The decimal point needs to move 9 places to the right to come to the spot just to the right of the digit 1.) This means that 0.000000001 equals $1.0 \div 10^{9}$, which is 1.0×10^{-9}. The correct answer is choice (D).

Content Categories: Numbers and Number Relationships / Procedural Knowledge

3. In 1972, a loaf of bread cost $0.89. In 2000, the same loaf of bread cost $2.69. The price of bread increased by about what percent?

(A) 33%

(B) 67%

(C) 200%

(D) 300%

The increase in price can be found by subtracting $0.89 from $2.69, which is $1.80. The percent increase in price is equal to the amount of increase divided by the original price, or $1.80 divided by $0.89. Since $1.80 is about twice $0.89, the percent increase in the price of bread is about 200%. The correct answer is choice (C).

Content Categories: Numbers and Number Relationships / Procedural Knowledge

4. A flower bed contains 72 orange daylilies, 65 yellow roses, 55 yellow marigolds, and 120 green ferns.

What is the ratio of orange flowers to yellow flowers?

(A)   3 to 5

(B)   3 to 8

(C)   3 to 10

(D)   3 to 13

There are 72 orange flowers and 65 + 55 or 120 yellow flowers. The ratio of orange flowers to yellow flowers is 72 to 120. This ratio can be simplified by dividing both terms by the greatest common factor, 24. The ratio in simplified form is 3 to 5. The correct answer is choice (A).

Content Categories: Numbers and Number Relationships / Procedural Knowledge

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5. If $m = 7(3 + 5)k$ and k is a positive integer, which of the following must be a factor of m ?

(A)   5

(B)   10

(C)   14

(D)   21

The problem gives that $m = 7(3 + 5)k$, which equals $7 \cdot 8 \cdot k$. Since k is a positive integer, m is a multiple of both 7 and 8, and also a multiple of any combination of factors of 7 and 8. The answer choice that must be a factor of m is 14, since 14 is the product of 7 and 2 (and 2 is a factor of 8). Alternatively, the product of 7 and 8 is 56 and $m = 56k$. 14 is the only choice given that is a factor of 56. Therefore, 14 must be a factor of m. The correct answer is choice (C).

Content Categories: Pre-Algebra / Conceptual Understanding

6. The formula for density is $d = \frac{m}{v}$, where m stands for mass in grams and v stands for volume in cubic centimeters. If steel has a density of 7.82 g /cm^3, what is the mass of a rectangular steel beam measuring 30 centimeters wide, 20 centimeters high, and 6 <u>meters</u> long?

(A)   460.36 g

(B)   28,152 g

(C)   46,035.81 g

(D)   2,815,200 g

The question gives a formula and asks for a particular value of m. In the formula, the unit for m is grams (g), the unit for v is cubic centimeters (cm^3) and the unit for d is grams per cubic centimeter (g /cm^3). The density for steel is given as 7.82 g /cm^3. You can figure out the volume in cubic centimeters, since the dimensions of the beam are 30 cm, 20 cm, and 6 meters. Converting meters to centimeters gives 6 meters = 6 x 100 cm, which equals 600 cm. The volume is 30 x 20 x 600 cm^3, which is 360,000 cm^3. Substituting 7.82 for d and 360,000 for v in the formula gives

$$7.82 = \frac{m}{360,000}.$$

Solve for m by multiplying 7.82 by 360,000. Students would not have calculators for this question, so some may choose to estimate the product as 8 x 400,000, or 3,200,000. In this estimate both rounding steps involved rounding up, so the actual answer is less than 3,200,000. The most reasonable answer choice is 2,815,200 g. The correct answer is choice (D).

Content Categories: Pre-Algebra / Problem Solving

7. In triangle *ABC*, the ratio of *x* to *y* is 2 to 3. What is the value of *x* ?

$\qquad$ (A)   20

$\qquad$ (B)   26

$\qquad$ (C)   40

$\qquad$ (D)   52

In triangle *ABC*, one angle measures 50°. Since the sum of the three angle measures is 180°, it follows that $x + y = 130$.

In addition, the ratio of *x* to *y* is 2 to 3. This means that $x/y = 2/3$ and therefore $y = 3/2\,x$.

Substituting $3/2\,x$ for *y* in the first equation gives $x + 3/2\,x = 130$.

From this you can see that $2x + 3x = 260$, so $5x = 260$, and therefore $x = 260/5 = 52$.

The correct answer is choice (D).

Content Categories: Geometry / Problem Solving

8. A fair coin is tossed 4 times. What is the probability that it will land heads up all 4 times?

(A)   2

(B) $1/2$

(C) $1/8$

(D) $1/16$

One way to solve this problem is to list all the possible outcomes of the four coin tosses. It is a good idea to list them in a systematic way. Here is one way to do that.

HHHH	HTHH	THHH	TTHH
HHHT	HTHT	THHT	TTHT
HHTH	HTTH	THTH	TTTH
HHTT	HTTT	THTT	TTTT

There are 16 possible outcomes, all equally likely. Only 1 outcome has all heads; so the probability of all heads is $1/16$.

It is also possible to use the concept of multiplying probabilities of independent events. The probability of a coin landing heads up in 1 toss is $1/2$. So, the probability of this event occurring 4 times is $1/2 \cdot 1/2 \cdot 1/2 \cdot 1/2 = 1/16$.

The correct answer is choice (D).

Content Categories: Probability / Problem Solving

9. If $a = b$, what is the value of $3 + 5(a - b)$?

(A) 0

(B) 3

(C) 5

(D) 8

If $a = b$, then $a - b = 0$, and the expression $3 + 5(a - b)$ equals $3 + 5(0)$.
Since $5(0) = 0$, the expression equals $3 + 0$, or 3. The correct answer is choice (B).

Content Categories: Pre-Algebra / Conceptual Understanding

Mathematics - Optional Constructed-Response Questions

1. Each of the teachers in Town School ordered the same total number of candy bars, but some teachers ordered the candy bars in packs of 9, some ordered packs of 4, and some ordered packs of 15. What is the smallest total number of candy bars that each teacher could have ordered?

Show how you arrived at your answer.

The number of candy bars ordered by each teacher must be a multiple of 9, a multiple of 4, and a multiple of 15. So the problem comes down to finding the least common multiple of 9, 4, and 15. One approach is to factor each number into its prime factors.

$$9 = 3 \times 3$$
$$4 = 2 \times 2$$
$$15 = 3 \times 5$$

Common multiples of these three numbers must have 3, 3, 2, 2, and 5 as factors. The least common multiple is $3 \times 3 \times 2 \times 2 \times 5$, which is 180.

It is also acceptable to list multiples of 9, 4, and 15 and pick 180 as the least number common to all three lists.
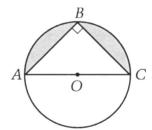
Students receive a score of 2 for the correct answer (180) with mathematically accurate work/explanations.

Students receive a score of 1 if

1) they answer 180 with work missing or incomplete or work that has multiple arithmetic errors

OR

2) they have a correct process, but because of an arithmetic error the answer is incorrect

OR

3) they found a common multiple of 9, 4, and 15 with work shown, but it is not the least common multiple.

Content Category: Math Communication

2. In the figure above $\triangle ABC$ is inscribed in the circle, centered at O, and $AB = BC = \overline{\sqrt{2}}$. What is the area of the shaded region?

Show your work or explain your reasoning.

The shaded region given is inside the half of the circle above diameter AC and outside of isosceles right triangle ABC. Therefore, the area of the shaded region is the difference between the area of the semicircle and the area of triangle ABC.

The area of the semicircle is half the area of the circle. You need to find the radius of the circle to find its area. The radius of the circle is half of a diameter. $\overline{AC}$ is a diameter of the circle and also the hypotenuse of the triangle ABC. Using the Pythagorean Theorem, you can find that the square of the length of $\overline{AC}$ is $(\sqrt{2})^2 + (\sqrt{2})^2$ or 4. Therefore, $AC = 2$ and the radius of the circle is 1. This implies that the area of the circle is $\pi(1)^2$ or π. Therefore, the area of the semicircle is $\pi/2$.

The area of triangle ABC is $1/2\,(AB)(BC) = \dfrac{(\sqrt{2})(\sqrt{2})}{2} = 1$

Therefore, the area of the shaded region is $\pi/2 - 1$.

Students receive full credit (a score of 2) for the correct answer with sufficient work/explanations.

Student receives partial credit (a score of 1) if

    1) the correct answer is given with insufficient work/explanations

                OR

    2) the answer given is incorrect, but the correct process is followed or explained

                OR

    3) the student applies the Pythagorean Theorem correctly and determines the correct areas of the semicircle and $\triangle ABC$ but does not find the difference between the areas.

Content Category: Math Communication

Algebra I

1. If a and b are constants and $(ax + b)(2x - 3) = 2x^2 + 5x - 12$ for all values of x, what is the value of $a + b$?

    (A) 3

    (B) 4

    (C) 5

    (D) 6

$(ax + b)(2x - 3) = 2x^2 + 5x - 12$ for all values of x.

The product of the factors $(ax + b)$ and $(2x - 3)$ is $2ax^2 + 2bx - 3ax - 3b$ or $2ax^2 + (2b - 3a)x - 3b$.
If this is equal to another quadratic in x for all values of x, then the coefficients of like terms must be equal.
Therefore, $2a = 2$ and $-3b = -12$, which implies $a = 1$ and $b = 4$. Additionally, $2b - 3a = 2 \cdot 4 - 3 \cdot 1 = 8 - 3 = 5$.
Thus, $a + b = 1 + 4 = 5$. The correct answer is choice (C).

Content Category: Equations and Inequalities

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2. The solution of which of the following inequalities is the set of all numbers that are more than 2 units from 6 ?

    (A) $|x| - 2 > 6$

    (B) $|x - 2| > 6$

    (C) $|x - 6| > 2$

    (D) $|x| - 6 > 2$

Each inequality given involves absolute value, which can be defined relative to the real number line as follows.

For any real numbers, a and b, $|a - b|$ is the distance between a and b on the real number line. Therefore, all numbers x that are more than 2 units from 6 or have a distance between x and 6 that is greater than 2 satisfy the inequality $|x - 6| > 2$. The correct answer is choice (C).

Content Category: Equations and Inequalities

3. The line containing points (1, –4) and (4, –7) must also contain point

(A) (10, –10)

(B) (0, –1)

(C) (–1, –2)

(D) (–5, 3)

Any point on the line must satisfy its equation. The two given points on the line can be used to find the slope of the line.

$$\text{Slope} = m = \frac{-4 - (-7)}{1 - 4} = \frac{3}{-3} = -1$$

In the form $y = mx + b$, the equation of the line is $y = -x + b$. This implies $-4 = -(1) + b$ or $b = -3$. Thus, the equation of the line is $y = -x - 3$. Of the choices, only option (C) satisfies this equation, since $-2 = -(-1) - 3$. The correct answer is choice (C).

This problem can also be solved by focusing on the slope of the line. As we saw above, the slope of the line is equal to $\frac{-4 - (-7)}{1 - 4} = -1$. The slope of a line remains constant, so you can determine which point is on the line by determining which produces a slope of –1 with one of the given points.

Content Category: ables, Graphs and Algebraic Geometry

4. Together Charlie and Patty have 45 books. Patty has twice as many books as Charlie. Let *c* represent the number of books Charlie has and *p* the number of books Patty has.
Which of the following systems of equations best expresses this information?

(A) $\begin{cases} c+p=45 \\ p=2c \end{cases}$

(B) $\begin{cases} c+p=45 \\ c=2p \end{cases}$

(C) $\begin{cases} c=2p \\ p=c+45 \end{cases}$

(D) $\begin{cases} p=2c \\ c=p+45 \end{cases}$

Since Charlie and Patty have 45 books together, the sum of the number of books each has is 45. Charlie has *c* books and Patty has *p* books; thus, $c+p=45$. Additionally, Patty has twice as many books as Charlie, which means if the number of books that Charlie has is multiplied by 2, then the result should be the number of books that Patty has. Therefore, $p=2c$. Thus, the system of equations that represents the given information is

$$\begin{cases} c+p=45 \\ p=2c \end{cases}$$

The correct answer is choice (A).

Content Category: Situations Involving Variable Quantities

5. If a and b are both positive and $ax + c + bx - y = 0$, then $x =$

(A) $\dfrac{y - c}{ab}$

(B) $\dfrac{y + c}{a - b}$

(C) $\dfrac{y - c}{a + b}$

(D) $\dfrac{y + c}{ab}$

Combine like terms and solve for x in the following manner.

$$ax + c + bx - y = 0$$
$$\Rightarrow \quad ax + bx + c - y = 0$$
$$\Rightarrow \quad (a + b)x + (c - y) = 0$$
$$\Rightarrow \quad (a + b)x = -(c - y)$$
$$\Rightarrow \quad x = \frac{-(c - y)}{a + b} = \frac{y - c}{a + b}$$

The correct answer is choice (C).

Content Category: Equations and Inequalities