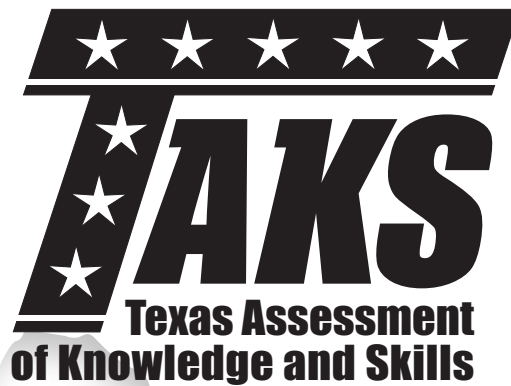


August 2004



Information Booklet

MATHEMATICS

Grade 5

Revised

Texas Education Agency • Student Assessment Division

INTRODUCTION

The Texas Assessment of Knowledge and Skills (TAKS) is a completely reconceived testing program. It assesses more of the Texas Essential Knowledge and Skills (TEKS) than the Texas Assessment of Academic Skills (TAAS) did and asks questions in more authentic ways. TAKS has been developed to better reflect good instructional practice and more accurately measure student learning. We hope that every teacher will see the connection between what we test on this new state assessment and what our students should know and be able to do to be academically successful. To provide you with a better understanding of TAKS and its connection to the TEKS and to classroom teaching, the Texas Education Agency (TEA) has developed this newly revised edition of the TAKS information booklet. The information booklets were originally published in January 2002, before the first TAKS field test. Now, after several years of field tests and live administrations, we are able to provide an even more comprehensive picture of the testing program. We have clarified some of the existing material and, in some cases, provided new sample items and/or more explanations of certain item types. However, it is important to remember that these clarifications do not signify any change in the TAKS testing program. The objectives and TEKS student expectations assessed on TAKS remain unchanged. We hope this revised version of the TAKS information booklet will serve as a user-friendly resource to help you understand that the best preparation for TAKS is a coherent, TEKS-based instructional program that provides the level of support necessary for all students to reach their academic potential.

BACKGROUND INFORMATION

The development of the TAKS program included extensive public scrutiny and input from Texas teachers, administrators, parents, members of the business community, professional education organizations, faculty and staff at Texas colleges and universities, and national content-area experts. The agency involved as many stakeholders as possible because we believed that the development of TAKS was a responsibility that had to be shared if this new assessment was to be an equitable and accurate measure of learning for all Texas public school students.

The three-year test-development process, which began in summer 1999, included a series of carefully conceived activities. First, committees of Texas educators identified those TEKS student expectations for each grade and subject area assessed that should be tested on a statewide assessment. Then a committee of TEA Student Assessment and Curriculum staff incorporated these selected TEKS student expectations, along with draft objectives for each subject area, into eleventh grade exit level surveys. These surveys were sent to Texas educators at the middle school and secondary levels for their review. Based on input we received from more than 27,000 survey responses, we developed a second draft of the objectives and TEKS student expectations. In addition, we used this input during the development of draft objectives and student expectations for grades 3 through 10 to ensure that the TAKS program, like the TEKS curriculum, would be vertically aligned. This vertical alignment was a critical step in ensuring that the TAKS tests would become more rigorous as students moved from grade to grade. For example, the fifth grade tests would be more rigorous than the fourth grade tests, which would be more rigorous than the third grade tests. Texas educators felt that this increase in rigor from grade to grade was both appropriate and logical since each subject-area test was closely aligned to the TEKS curriculum at that grade level.

In fall 2000 TEA distributed the second draft of the objectives and TEKS student expectations for eleventh grade exit level and the first draft of the objectives and student expectations for grades 3 through 10 for review at the campus level. These documents were also posted on the Student Assessment Division’s website to encourage input from the public. Each draft document focused on two central issues: first, whether the objectives included in the draft were essential to measure on a statewide assessment; and, second, whether students would have received enough instruction on the TEKS student expectations included under each objective to be adequately prepared to demonstrate mastery of that objective in the spring of the school year. We received more than 57,000 campus-consensus survey responses. We used these responses, along with feedback from national experts, to finalize the TAKS objectives and student expectations. Because the state assessment was necessarily limited to a “snapshot” of student performance, broad-based input was important to ensure that TAKS assessed the parts of the TEKS curriculum most critical to students’ academic learning and progress.

In the thorough test-development process that we use for the TAKS program, we rely on educator input to develop items that are appropriate and valid measures of the objectives and TEKS student expectations the items are designed to assess. This input includes an annual educator review and revision of all proposed test items before field-testing and a second annual educator review of data and items after field-testing. In addition, each year panels of recognized experts in the fields of English language arts (ELA), mathematics, science, and social studies meet in Austin to critically review the content of each of the high school level TAKS assessments to be administered that year. This critical review is referred to as a content validation review and is one of the final activities in a series of quality-control steps designed to ensure that each high school test is of the highest quality possible. A content validation review is considered necessary at the high school grades (9, 10, and 11) because of the advanced level of content being assessed.

ORGANIZATION OF THE TAKS TESTS

TAKS is divided into test objectives. It is important to remember that the objective statements are not found in the TEKS curriculum. Rather, the objectives are “umbrella statements” that serve as headings under which student expectations from the TEKS can be meaningfully grouped. Objectives are broad statements that “break up” knowledge and skills to be tested into meaningful subsets around which a test can be organized into reporting units. These reporting units help campuses, districts, parents, and the general public understand the performance of our students and schools. Test objectives are not intended to be “translations” or “rewordings” of the TEKS. Instead, the objectives are designed to be identical across grade levels rather than grade specific. Generally, the objectives are the same for third grade through eighth grade (an elementary/middle school system) and for ninth grade through eleventh grade (a high school system). In addition, certain TEKS student expectations may logically be grouped under more than one test objective; however, it is important for you to understand that this is not meaningless repetition—sometimes the organization of the objectives requires such groupings. For example, on the TAKS writing tests for fourth and seventh grades, some of the same student expectations addressing the conventions of standard English usage are listed under both Objective 2 and Objective 6. In this case, the expectations listed under Objective 2 are assessed through the overall strength of a student’s use of language conventions on the written composition portion of the test; these same expectations under Objective 6 are assessed through multiple-choice items attached to a series of revising and editing passages.

ORGANIZATION OF THE INFORMATION BOOKLETS

The purpose of the information booklets is to help Texas educators, students, parents, and other stakeholders understand more about the TAKS tests. These booklets are not intended to replace the teaching of the TEKS curriculum, provide the basis for the isolated teaching of skills in the form of narrow test preparation, or serve as the single information source about every aspect of the TAKS program. However, we believe that the booklets provide helpful explanations as well as show enough sample items, reading and writing selections, and prompts to give educators a good sense of the assessment.

Each grade within a subject area is presented as a separate booklet. However, it is still important that teachers review the information booklets for the grades both above and below the grade they teach. For example, eighth grade mathematics teachers who review the seventh grade information booklet as well as the ninth grade information booklet are able to develop a broader perspective of the mathematics assessment than if they study only the eighth grade information booklet.

The information booklets for each subject area contain some information unique to that subject. For example, the mathematics chart that students use on TAKS is included for each grade at which mathematics is assessed. However, all booklets include the following information, which we consider critical for every subject-area TAKS test:

- an overview of the subject within the context of TAKS
- a blueprint of the test—the number of items under each objective and the number of items on the test as a whole
- information that clarifies how to read the TEKS
- the reasons each objective and its TEKS student expectations are critical to student learning and success
- the objectives and TEKS student expectations that are included on TAKS
- additional information about each objective that helps educators understand how it is assessed on TAKS
- sample items that show some of the ways objectives are assessed

TAKS MATHEMATICS INFORMATION BOOKLET GENERAL INTRODUCTION

Learning mathematics is essential in finding answers to real-life questions. The study of mathematics helps students to think logically, solve problems, and understand spatial relationships. The concepts learned in mathematics courses help students communicate clearly and use logical reasoning to make sense of their world. TEKS instruction in mathematics throughout elementary, middle, and high school will build the foundation necessary for students to succeed in advanced math and science courses and later in their careers.

The six strands identified in the mathematics curriculum for kindergarten through eighth grade are the foundation skills necessary for high school-level mathematics courses. The TAKS assessment objectives are closely aligned with the six strands identified in the TEKS curriculum. For example, in TAKS Objective 1 students are to “demonstrate an understanding of numbers, operations, and quantitative reasoning”; in the TEKS curriculum the first strand identified is “number, operation, and quantitative reasoning.” This close alignment reflects the important link between TAKS and the TEKS curriculum. In fact, the TAKS mathematics tests are based on those TEKS student expectations Texas educators have identified as the most critical to student achievement and progress in mathematics.

The TEKS were developed to provide educators with instructional goals at each grade level. Although some student expectations are not tested, they are nonetheless critical for student understanding and must be included in classroom instruction. For each strand of learning, the mathematics TEKS provide more rigorous expectations as students master skills and progress through the curriculum. It is important for educators to vertically align their instructional programs to reinforce the unifying strands of learning each year through grade-level-appropriate instruction. To understand how student learning progresses, educators are encouraged to become familiar with the curriculum at all grade levels. Educators may find it helpful to examine sample items at each grade level to gain a greater understanding of what students need to know and be able to do in mathematics as they move from grade to grade.

A system of support has been designed to ensure that all students master the TEKS. The Student Success Initiative (SSI) requires that students meet the standard on TAKS to be eligible for promotion to the next grade level as specified below:

- the reading test at Grade 3, beginning in the 2002–2003 school year;
- the reading and mathematics tests at Grade 5, beginning in the 2004–2005 school year; and
- the reading and mathematics tests at Grade 8, beginning in the 2007–2008 school year.

To prepare students for the SSI requirements and to promote vertical alignment, it is essential that teachers collaborate and coordinate across grade levels.

TAKS MATHEMATICS INFORMATION BOOKLET GRADE 5

The fifth grade mathematics TEKS describe what students should know and be able to do in fifth grade. However, teachers need to be aware of the “big picture”—an understanding of the TEKS curriculum for both the lower and the higher grades. This awareness of what comes before and after fifth grade will enable teachers to more effectively help their students develop mathematics knowledge and skills.

TEST FORMAT

- The fifth grade test includes a test booklet and a separate machine-scorable answer document. Enough room is left around each item in the booklet for students to work each problem. However, student responses must be recorded on the separate answer document.
- Any item may include application context and extraneous information.
- Most items will be in a multiple-choice format with four answer choices.
- *Not here* or a variation of this phrase may be used as the fourth answer choice when appropriate.
- There will be a limited number of open-ended griddable items. For these items a four-column grid (with the last column designated as a fixed decimal point) will be provided on the answer document for students to record and bubble in their answers. Digits must be in the correct column(s) with respect to the fixed decimal point. This griddable format is intended to allow students to work a problem and determine the correct answer without being influenced by answer choices. An example of a blank grid is shown below.

			.
0	0	0	
1	1	1	
2	2	2	
3	3	3	
4	4	4	
5	5	5	
6	6	6	
7	7	7	
8	8	8	
9	9	9	

MATHEMATICS CHART

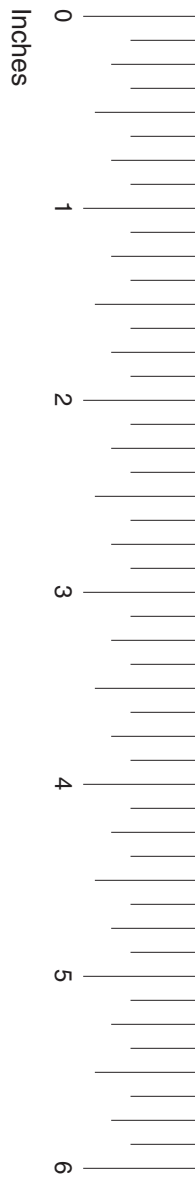
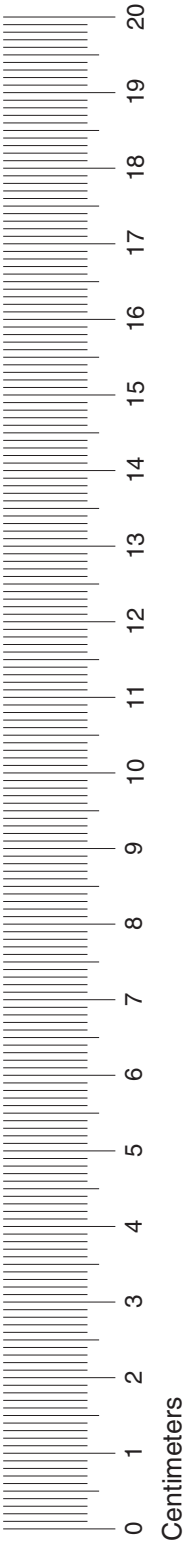
- For fifth grade the Mathematics Chart (found on pages 8 and 9) will have measurement conversions on the front and formulas on the back.
- A metric ruler and a customary ruler will be provided on the front of the separate Mathematics Chart.
- Items that require students to measure with a ruler from the Mathematics Chart may be found in any objective as appropriate.

**TEXAS ASSESSMENT OF KNOWLEDGE AND SKILLS (TAKS)
BLUEPRINT FOR GRADE 5 MATHEMATICS**

TAKS Objectives	Number of Items
Objective 1: Numbers, Operations, and Quantitative Reasoning	11
Objective 2: Patterns, Relationships, and Algebraic Reasoning	7
Objective 3: Geometry and Spatial Reasoning	7
Objective 4: Measurement	7
Objective 5: Probability and Statistics	4
Objective 6: Mathematical Processes and Tools	8
Total number of items	44

Grade 5

Mathematics Chart



LENGTH

Metric

1 kilometer = 1000 meters
 1 meter = 100 centimeters
 1 centimeter = 10 millimeters

Customary

1 mile = 1760 yards
 1 mile = 5280 feet
 1 yard = 3 feet
 1 foot = 12 inches

CAPACITY AND VOLUME

Metric

1 liter = 1000 milliliters

Customary

1 gallon = 4 quarts
 1 gallon = 128 ounces
 1 quart = 2 pints
 1 pint = 2 cups
 1 cup = 8 ounces

MASS AND WEIGHT

Metric

1 kilogram = 1000 grams
 1 gram = 1000 milligrams

Customary

1 ton = 2000 pounds
 1 pound = 16 ounces

TIME

1 year = 365 days
 1 year = 12 months
 1 year = 52 weeks
 1 week = 7 days
 1 day = 24 hours
 1 hour = 60 minutes
 1 minute = 60 seconds

Grade 5 Mathematics Chart

Perimeter	square	$P = 4s$
	rectangle	$P = 2l + 2w$ or $P = 2(l + w)$
Area	square	$A = s^2$
	rectangle	$A = lw$ or $A = bh$
	triangle	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$

A Key to Understanding the TEKS Included on TAKS

Example from Objective 2

(5.5) ^A **Patterns, relationships, and algebraic thinking.** The student makes generalizations based on observed patterns and relationships. The student is expected to

B → (A) use [concrete objects or] ^C pictures to make generalizations about determining all possible combinations.

KEY

A. Knowledge and Skills Statement

This broad statement describes what students should know and be able to do for fifth grade mathematics. The number preceding the statement identifies the instructional level and the number of the knowledge and skills statement.

B. Student Expectation

This specific statement describes what students should be able to do to demonstrate proficiency in what is described in the knowledge and skills statement. Students will be tested on skills outlined in the student expectation statement.

C. [bracketed text]

Although the entire student expectation has been provided for reference, text in brackets indicates that this portion of the student expectation will not specifically be tested on TAKS.

NOTE: The full TEKS curriculum can be found at <http://www.tea.state.tx.us/teks/>.

TEKS STUDENT EXPECTATIONS—IMPORTANT VOCABULARY

For every subject area and grade level, two terms—*such as* and *including*—are used to help make the TEKS student expectations more concrete for teachers. However, these terms function in different ways. To help you understand the effect each of the terms has on specific student expectations, we are providing the following:

- a short definition of each term;
- an example from a specific student expectation for this subject area; and
- a short explanation of how this term affects this student expectation.

Such as

The term *such as* is used when the specific examples that follow it function only as representative illustrations that help define the expectation for teachers. These examples are just that—examples. Teachers may choose to use them when teaching the student expectation, but there is no requirement to use them. Other examples can be used in addition to those listed or as replacements for those listed.

Example from Objective 4

(5.11) (B) describe numerical relationships between units of measure within the same measurement system, such as an inch is one-twelfth of a foot.

This student expectation lists a numerical relationship: *such as an inch is one-twelfth of a foot*. Many other numerical relationships exist involving measurement concepts.

Including

The term *including* is used when the specific examples that follow it must be taught. However, other examples may also be used in conjunction with those listed.

Example from Objective 3

(5.7) (A) identify critical attributes, including parallel, perpendicular, and congruent parts of geometric shapes and solids.

This student expectation lists several critical attributes of geometric shapes and solids to include in instruction. Other critical attributes may be taught in addition to those listed.

Remember

- Any example preceded by the term *such as* in a particular student expectation may or may not provide the basis for an item assessing that expectation. Because these examples do not necessarily have to be used to teach the student expectation, it is equally likely that other examples may be used in assessment items. The rule here is that an example will be used only if it is central to the knowledge, concept, or skill the item assesses.
- It is more likely that some of the examples preceded by the term *including* in a particular student expectation will provide the basis for items assessing that expectation, since these examples must be taught. However, it is important to remember that the examples that follow the term *including* do not represent all the examples possible, so other examples may also provide the basis for an assessment item. Again, the rule here is that an example will be used only if it is central to the knowledge, concept, or skill the item assesses.

Grade 5 TAKS Mathematics—Objective 1

Knowledge of **numbers, operations, and quantitative reasoning** is critical for the development of mathematical skills. Students need to understand numbers as digits, words, and models. They need to understand the value of each digit based on its position in a number, including fractions and decimals, in order to read and work with numbers. Students should also understand fractional and decimal parts of a whole. From these basic concepts students move toward understanding specific combinations of whole numbers, fractions, and decimals as solutions to problems. More abstract concepts and complicated numbers will be used as students work with and distinguish among the four basic operations of addition, subtraction, multiplication, and division. Students should understand prime factors of whole numbers and common factors of a set of whole numbers so that composite numbers can be broken down into more workable units. Students should also be developing a sense of the reasonableness of an expected answer. Quantitative reasoning is knowing when an answer makes sense and is one purpose for rounding numbers to estimate. Numbers are also rounded when an exact answer is not required. Students should be prepared to apply the basic concepts included in Objective 1 to other concepts in fifth grade mathematics. In addition, the knowledge and skills in Objective 1 at fifth grade are closely aligned with and provide the foundation for mastering the knowledge and skills in Objective 1 at sixth grade.

Objective 1 groups together the basic building blocks within the TEKS—**numbers, operations, and quantitative reasoning**—from which all mathematical understanding stems.

TAKS Objectives and TEKS Student Expectations

Objective 1

The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.

- (5.1) **Number, operation, and quantitative reasoning.** The student uses place value to represent whole numbers and decimals. The student is expected to
- (A) use place value to read, write, compare, and order whole numbers through the billions place; and
 - (B) use place value to read, write, compare, and order decimals through the thousandths place.
- (5.2) **Number, operation, and quantitative reasoning.** The student uses fractions in problem-solving situations. The student is expected to
- (A) generate equivalent fractions;
 - (B) compare two fractional quantities in problem-solving situations using a variety of methods, including common denominators; and

- (C) use models to relate decimals to fractions that name tenths, hundredths, and thousandths.
- (5.3) **Number, operation, and quantitative reasoning.** The student adds, subtracts, multiplies, and divides to solve meaningful problems. The student is expected to
- (A) use addition and subtraction to solve problems involving whole numbers and decimals;
 - (B) use multiplication to solve problems involving whole numbers (no more than three digits times two digits without technology);
 - (C) use division to solve problems involving whole numbers (no more than two-digit divisors and three-digit dividends without technology);
 - (D) identify prime factors of a whole number and common factors of a set of whole numbers; and
 - (E) model and record addition and subtraction of fractions with like denominators in problem-solving situations.
- (5.4) **Number, operation, and quantitative reasoning.** The student estimates to determine reasonable results. The student is expected to
- (A) round whole numbers and decimals through tenths to approximate reasonable results in problem situations; and
 - (B) estimate to solve problems where exact answers are not required.

Objective 1—For Your Information

The following list provides additional information for some of the student expectations tested in Objective 1. At fifth grade, students should be able to

- sequence numbers or the words associated with numbers (for example, listing the names of mountains in order from least to greatest based on their heights);
- solve problems with fractions or decimals representing whole numbers, numbers greater than one, or numbers less than one;
- compare several pairs of fractions when solving problems;
- work with problems that include information expressed as numbers or ranges of numbers; and
- round numbers before performing any computations when estimating. The use of compatible numbers (numbers that are easy to compute mentally) may be helpful.

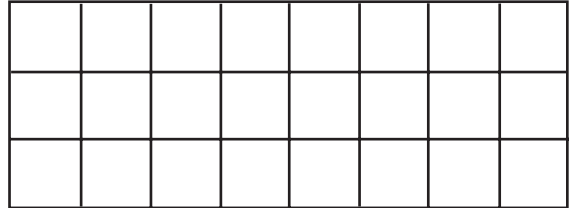
Objective 1 Sample Items

- 1 Mrs. Kennedy wants to save \$632 to buy a new washing machine. She saves \$70 each month. What is a reasonable number of months it should take Mrs. Kennedy to save enough money to buy the washing machine?
- A 7
B 8
C* 9
D 10

Note: In this item 632 is close to 630, which is easily divisible by 70. The use of compatible numbers is one way to find reasonable results.

- 2 Rex walked 3 of his 6 dogs. Which fraction is less than $\frac{3}{6}$?
- A* $\frac{2}{7}$
B $\frac{3}{5}$
C $\frac{1}{2}$
D $\frac{5}{6}$

- 3 Fran brought a giant candy bar to share with her classmates. The bar was divided evenly into 24 pieces as shown below. Fran gave away 15 pieces. What fraction of the bar did she have left?



- A $\frac{5}{6}$
B $\frac{5}{8}$
C* $\frac{3}{8}$
D $\frac{3}{12}$
- 4 Mrs. Reyes is shopping for new clothes. She has \$50 to spend. She wants to buy a shirt for \$18.39, shorts for \$22.64, and a hat for \$5.27. All prices include tax. How much money will she have left after paying for these 3 items?
- A \$46.30
B \$31.61
C \$8.97
D* \$3.70

Grade 5 TAKS Mathematics—Objective 2

Understanding **patterns, relationships, and algebraic thinking** is an integral component of the foundation of basic algebra. Discovering patterns with whole numbers and fractions, recognizing numerical relationships, making generalizations, and solving problems help build the groundwork for learning more-complex algebraic concepts. Pattern recognition and application are important in many other disciplines, such as science, art, and social studies. Being able to distinguish between prime and composite numbers will help fifth grade students simplify mathematical expressions. Students should also be able to describe relationships mathematically by using diagrams and number sentences to solve for unknowns in practical situations. An understanding of the concepts included in Objective 2 should prepare students to continue learning more-advanced algebraic ideas. In addition, mastering the knowledge and skills in Objective 2 at fifth grade will help students master the knowledge and skills in Objective 2 at sixth grade.

Objective 2 combines the basic algebra concepts within the TEKS—**patterns, relationships, and algebraic thinking**.

TAKS Objectives and TEKS Student Expectations

Objective 2

The student will demonstrate an understanding of patterns, relationships, and algebraic reasoning.

- (5.5) **Patterns, relationships, and algebraic thinking.** The student makes generalizations based on observed patterns and relationships. The student is expected to
- (A) use [concrete objects or] pictures to make generalizations about determining all possible combinations;
 - (B) use lists, tables, charts, and diagrams to find patterns and make generalizations, such as a procedure for determining equivalent fractions; and
 - (C) identify prime and composite numbers using [concrete] models and patterns in factor pairs.
- (5.6) **Patterns, relationships, and algebraic thinking.** The student describes relationships mathematically. The student is expected to
- (A) select from and use diagrams and number sentences to represent real-life situations.

Objective 2—For Your Information

The following list provides additional information for some of the student expectations tested in Objective 2. At fifth grade, students should be able to

- determine all possible combinations when given written and/or pictorial representations of choices;
- describe patterns and relationships using a written statement; and
- match a problem situation with an equation or diagram.

Objective 2 Sample Items

- 1 Each week Leanne spends the same amount of money to buy her lunch at school. She keeps a list in her notebook of how much money she has spent on lunches since the school year began. The table shows part of her list.

Leanne's Lunches

Week of School	Total Amount Spent
6	\$60
7	\$70
8	\$80
9	\$90

Which is **NOT** a way to find how much money Leanne spends on lunches each week?

- A Divide \$90 by 9
B Divide \$60 by 6
C* Subtract \$60 from \$90
D Subtract \$70 from \$80
- 2 Marsha had \$22.50 to spend. She purchased 3 CDs for \$7.50 each. Which number sentence can be used to find how much money Marsha had left?

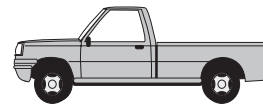
- A $\$22.50 - (\$7.50 + 3) = \square$
B $\$22.50 + (\$7.50 - 3) = \square$
C $\$22.50 \div (\$7.50 - 3) = \square$
D* $\$22.50 - (\$7.50 \times 3) = \square$

- 3 Danae's father owns a vehicle paint shop. He can use the colors gray, red, black, or white to paint a vehicle. The vehicles he will paint today are shown below.

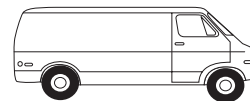
Car



Truck



Van



Boat



If Danae's father paints each vehicle with 1 color of paint, how many different combinations of paint color and vehicle are possible?

- A* 16
B 8
C 4
D 10

Grade 5 TAKS Mathematics—Objective 3

Knowledge of **geometry and spatial reasoning** is important because the structure of the world is based on geometric properties. With this knowledge students should be able to identify and describe lines, shapes, and solids using specific geometric terms (for example, obtuse, perpendicular, and vertices). Students should be able to connect transformations to congruency and symmetry. These connections enable students to recognize congruent and symmetrical shapes in fields such as art and science. It is essential that students learn to plot points on a coordinate grid using ordered pairs of whole numbers. Mastering these concepts builds spatial reasoning skills that help develop an understanding of distance and location. The knowledge and skills in Objective 3 will help students understand the basic concepts of geometry as related to the real world. In addition, the knowledge and skills in Objective 3 at fifth grade are closely aligned with the knowledge and skills in Objective 3 at sixth grade.

Objective 3 combines the fundamental concepts of size and shape found within the TEKS—**geometry and spatial reasoning**—from which all geometric understanding is built.

TAKS Objectives and TEKS Student Expectations

Objective 3

The student will demonstrate an understanding of geometry and spatial reasoning.

- (5.7) **Geometry and spatial reasoning.** The student generates geometric definitions using critical attributes. The student is expected to
- (A) identify critical attributes, including parallel, perpendicular, and congruent parts of geometric shapes and solids; and
 - (B) use critical attributes to define geometric shapes or solids.
- (5.8) **Geometry and spatial reasoning.** The student models transformations. The student is expected to
- (A) sketch the results of translations, rotations, and reflections; and
 - (B) describe the transformation that generates one figure from the other when given two congruent figures.
- (5.9) **Geometry and spatial reasoning.** The student recognizes the connection between ordered pairs of numbers and locations of points on a plane. The student is expected to
- (A) locate and name points on a coordinate grid using ordered pairs of whole numbers.

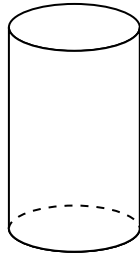
Objective 3—For Your Information

The following list provides additional information for some of the student expectations tested in Objective 3. At fifth grade, students should be able to

- match a figure with its attributes. An attribute is a characteristic that helps define a figure (for example, a triangular prism has nine edges);
- match the name of a transformation with its pictorial representation; and
- work with coordinate grids limited to the first quadrant.

Objective 3 Sample Items

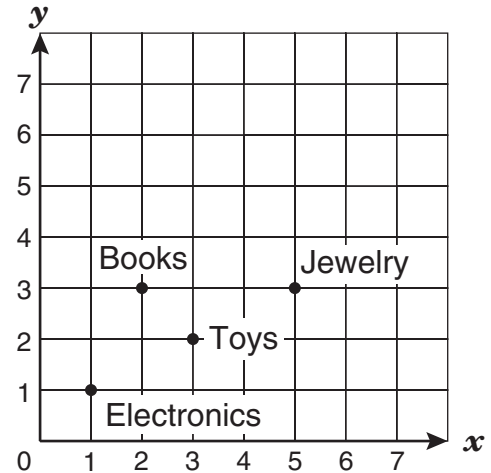
- 1 Look at the drawing below.



Which statement about this figure is true?

- A The figure is a cone.
- B The figure has 4 faces.
- C The figure has 2 rectangular faces.
- D* The figure has no vertices.

- 2 The graph shows some areas of a department store.



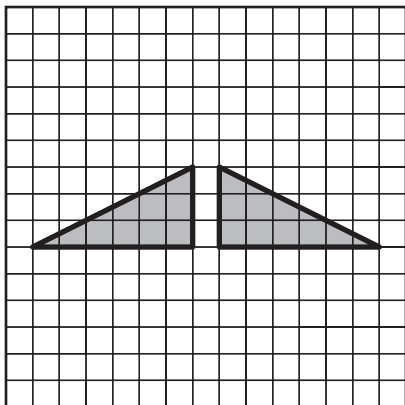
Which store area is best represented by the ordered pair (2, 3)?

- A Electronics
- B* Books
- C Toys
- D Jewelry

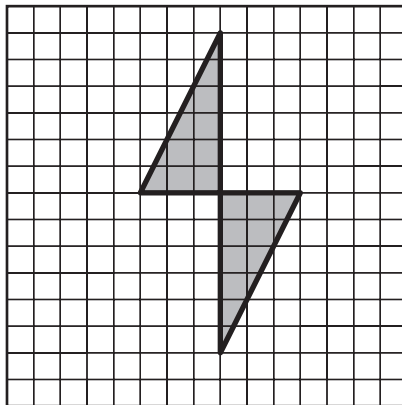
Objective 3 Sample Items

3 Which diagram shows only a translation of the figure?

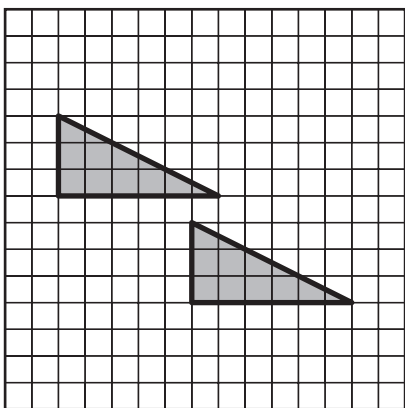
A



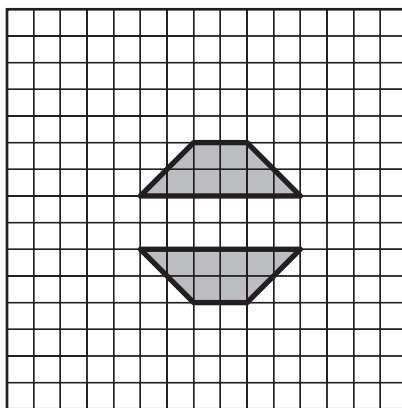
C



B*



D



Grade 5 TAKS Mathematics—Objective 4

Understanding the concepts and uses of **measurement** provides a basis for developing geometry skills. Students need to know how to find the volume of a model. This knowledge provides students the skills needed to solve geometric problems using formulas. Students should also know and understand the application of measurement concepts to problem solving. As students continue to develop their measurement skills, they should also learn how to recognize numerical relationships between units of measure. Measurement skills have many real-world applications. Understanding the basic concepts included in Objective 4 will prepare students to apply measurement skills in various situations. In addition, the knowledge and skills found in Objective 4 at fifth grade are closely aligned with the knowledge and skills found in Objective 4 at sixth grade.

Objective 4 includes the concepts within the TEKS from which an understanding of **measurement** is developed.

TAKS Objectives and TEKS Student Expectations

Objective 4

The student will demonstrate an understanding of the concepts and uses of measurement.

(5.10) **Measurement.** The student selects and uses appropriate units and procedures to measure volume. The student is expected to

(A) measure volume using [concrete] models of cubic units.

(5.11) **Measurement.** The student applies measurement concepts. The student is expected to

(A) measure to solve problems involving length (including perimeter), weight, capacity, time, temperature, and area; and

(B) describe numerical relationships between units of measure within the same measurement system, such as an inch is one-twelfth of a foot.

Objective 4—For Your Information

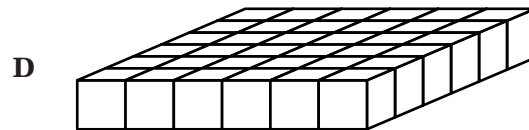
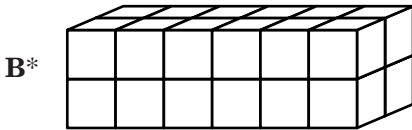
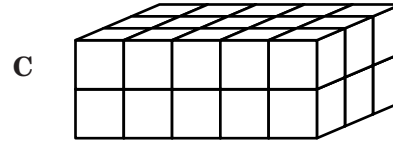
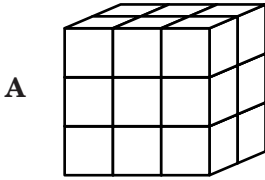
The following list provides additional information for some of the student expectations tested in Objective 4. At fifth grade, students should be able to

- utilize the conversions and formulas on the Mathematics Chart to solve problems;

- measure with the ruler on the Mathematics Chart *only if* the item specifically instructs students to use the ruler;
- use the given dimensions of a figure to solve a problem;
- recognize abbreviations of measurement units;
- solve volume problems by counting models of cubic units; and
- compare two different units of measure within the same system, either customary or metric, and choose the unit of measure that fits a given relationship (for example, 18 inches can be expressed as $1\frac{1}{2}$ feet or $\frac{1}{2}$ yard).

Objective 4 Sample Items

- 1 Which of these rectangular prisms has a volume of 24 cubic units?



Note: In this item, students can count the number of 1-unit cubes in the top layer of each model. Recognizing the number of 1-unit cubes in one layer, students can determine the volume of each rectangular prism. Finding volume using this procedure helps develop the volume formula used at higher grades.

- 2 Mike wants to watch a movie on television. The movie starts at 8:00 P.M. and is 135 minutes long. What time will the movie end?
- A 9:35 P.M.
B 10:00 P.M.
C* 10:15 P.M.
D 10:35 P.M.

Grade 5 TAKS Mathematics—Objective 5

Understanding **probability and statistics** will help students become informed consumers of data and information. Describing and predicting the results of probability experiments will help students develop the skills to predict outcomes to real-world situations. Students will learn to interpret various sets of data and understand the significance of the information so that it can be displayed in the most appropriate graphical representation. The ability to analyze data is an important skill. Students should be able to correctly manipulate information from graphical formats in order to communicate that information effectively. Understanding the concepts from Objective 5 is essential for processing everyday information. In addition, the knowledge and skills in Objective 5 at fifth grade are closely aligned with the knowledge and skills in Objective 5 at sixth grade.

Objective 5 includes the concepts within the TEKS that form the groundwork for an understanding of **probability and statistics**.

TAKS Objectives and TEKS Student Expectations

Objective 5

The student will demonstrate an understanding of probability and statistics.

(5.12) **Probability and statistics.** The student describes and predicts the results of a probability experiment. The student is expected to

- (A) use fractions to describe the results of an experiment; and
- (B) use experimental results to make predictions.

(5.13) **Probability and statistics.** The student solves problems by collecting, organizing, displaying, and interpreting sets of data. The student is expected to

- (A) use tables of related number pairs to make line graphs;
- (B) describe characteristics of data presented in tables and graphs, including the shape and spread of the data and the middle number; and
- (C) graph a given set of data using an appropriate graphical representation, such as a picture or line.

Objective 5—For Your Information

The following list provides additional information for some of the student expectations tested in Objective 5. At fifth grade, students should be able to

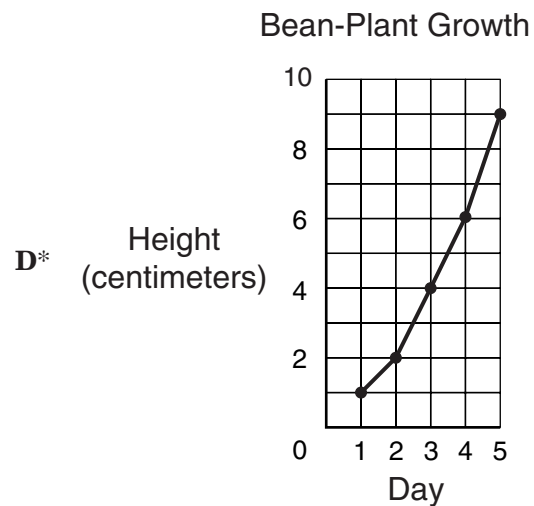
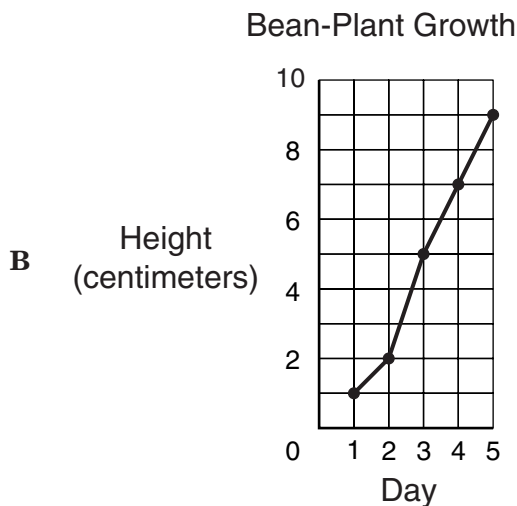
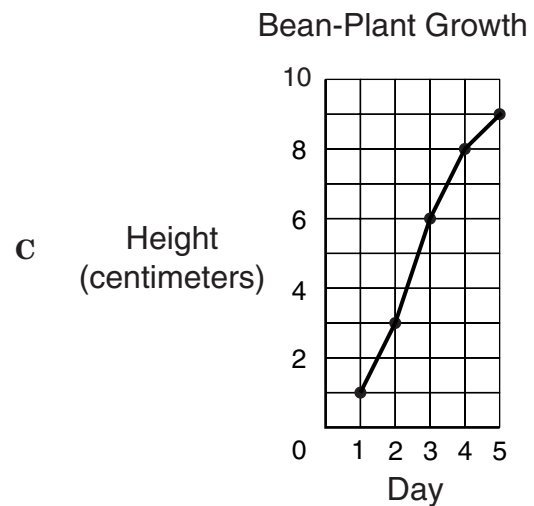
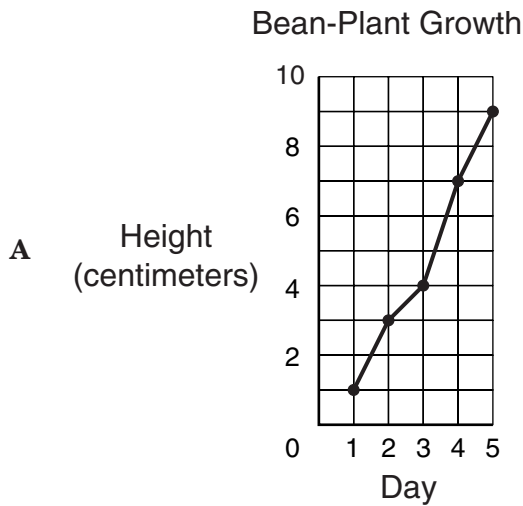
- match the spread (range) or the middle number (median) with its data set; and
- determine whether the graphical representation of data is appropriate and/or accurate.

Objective 5 Sample Items

1 After Lisa's bean plant started to grow, she recorded its growth in the table below.

Day	Height of Plant
1	1 cm
2	2 cm
3	4 cm
4	6 cm
5	9 cm

Which line graph shows the growth of her bean plant?



Objective 5 Sample Items

- 2 The table shows the number of coupons used at Karen's Gift Shop each month last year.

**Coupons Used at
Karen's Gift Shop**

Month	Number of Coupons
January	16
February	8
March	9
April	12
May	10
June	9
July	23
August	14
September	17
October	24
November	27
December	23

What is the median number of coupons used each month last year?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

	1	5	.
0	0	0	
1	1	1	
2	2	2	
3	3	3	
4	4	4	
5	5	5	
6	6	6	
7	7	7	
8	8	8	
9	9	9	

Note: In this set of data, there is an even number of months. After numerically arranging the data, students should find the number of coupons between the two middle numbers in the data set.

- 3 Valerie has 5 pens, 4 markers, and 3 pencils in her backpack. If Valerie reaches into her backpack and pulls out something to write with without looking, what is the probability that it will be a pencil?

- A $\frac{3}{4}$
- B $\frac{5}{12}$
- C $\frac{1}{3}$
- D* $\frac{1}{4}$

Note: Students should be able to recognize a fraction in simplified form.

Grade 5 TAKS Mathematics—Objective 6

Knowledge and understanding of **underlying processes and mathematical tools** are critical for students to be able to apply mathematics in their everyday lives. Problems found in everyday life often require the use of multiple concepts and skills. Students should be able to recognize mathematics as it occurs in real-life problem situations, generalize from mathematical patterns and sets of examples, select an appropriate approach to solving a problem, solve the problem, and then determine whether the answer is reasonable. Expressing problem situations in mathematical language and symbols is essential for finding solutions to real-life questions. These concepts allow students to communicate clearly and use logical reasoning to make sense of their world. Students can then connect the concepts they have learned in mathematics to other disciplines and to higher mathematics. Through understanding the basic ideas found in Objective 6, students will be able to analyze and solve real-world problems. In addition, the knowledge and skills in Objective 6 at fifth grade are closely aligned with the knowledge and skills in Objective 6 at sixth grade.

Objective 6 incorporates the **underlying processes and mathematical tools** within the TEKS that are used in finding mathematical solutions to real-world problems.

TAKS Objectives and TEKS Student Expectations

Objective 6

The student will demonstrate an understanding of the mathematical processes and tools used in problem solving.

- (5.14) **Underlying processes and mathematical tools.** The student applies Grade 5 mathematics to solve problems connected to everyday experiences and activities in and outside of school. The student is expected to
- (A) identify the mathematics in everyday situations;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness; and
 - (C) select or develop an appropriate problem-solving strategy, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem.
- (5.15) **Underlying processes and mathematical tools.** The student communicates about Grade 5 mathematics using informal language. The student is expected to
- (B) relate informal language to mathematical language and symbols.

- (5.16) **Underlying processes and mathematical tools.** The student uses logical reasoning to make sense of his or her world. The student is expected to
- (A) make generalizations from patterns or sets of examples and nonexamples.

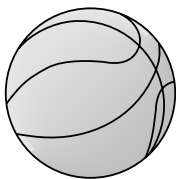
Objective 6—For Your Information

The following list provides additional information for some of the student expectations tested in Objective 6. At fifth grade, students should be able to

- select the description of a mathematical situation when provided with a written or pictorial prompt;
- identify the information that is needed to solve a problem;
- select or describe the next step or a missing step in a problem-solving situation;
- match informal language to mathematical language or symbols;
- identify the question that is being asked or answered;
- identify the common characteristic among examples;
- select an example or a nonexample based on a common characteristic. A nonexample proves a general statement to be false; and
- understand that nonsensical words may be used to label sets of examples and/or nonexamples.

Objective 6 Sample Items

- 1 Jordan earned some money for doing chores. Now he would like to buy some sports equipment.



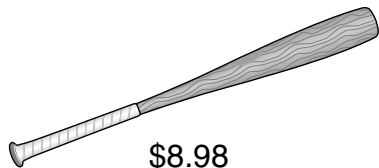
\$15.98



\$14.58



\$5.65



\$8.98

Which question below can be answered using the information given?

- A** What is the name of the store where Jordan will buy the equipment?
- B** What hours will the store be open?
- C*** What is the range of the prices shown?
- D** Does Jordan have enough money to buy running shoes?

- 2 In a 2-week period, the Plum Island Ferry spent 56 hours traveling back and forth between the island and the mainland. If the boat made 1 round-trip per day, how many hours did each round-trip take?

- A** 2 h
- B*** 4 h
- C** 58 h
- D** 112 h

- 3 A theater has 12 rows with 15 seats in each row. If 108 seats are occupied, which of the following shows a way to find the number of empty seats in the theater?

- A*** Subtract 108 from the product of 15 and 12
- B** Subtract 15 from the product of 108 and 12
- C** Add 108 to the product of 15 and 12
- D** Add 15 to the product of 108 and 12