Texas Essential Knowledge and Skills

TEKS

DECONSTRUCTED for CLASSROOM IMPACT

FIFTH GRADE
MATHEMATICS

C2 Collaborative, Inc.
Supporting Today's Educators, Shaping Tomorrow's Leaders

Introduction

C2 Collaborative is pleased to offer this grade-level tool for all Texas educators to utilize in applying the Texas Essential Knowledge and Skills (TEKS) in their classrooms.

The *TEKS Deconstructed Standards for Classroom Impact* is designed for educators, by educators, as a two-pronged resource and tool to:

1. help educators increase their depth of understanding of the TEKS; and
2. enable teachers to integrate the Texas College & Career Readiness Standards (CCRS) into their curriculum and classroom instruction to promote inquiry and higher levels of cognitive demand.

What we have done is not new. This work is a purposeful and thoughtful compilation of preexisting materials in the public domain, state department of education websites, and original work by the Center for College & Career Readiness™. Among the works that have been compiled and/or referenced are the following: Texas Essential Knowledge and Skills by Texas Education Agency (TEA), Texas College and Career Readiness Standards by Texas Higher Education Coordinating Board and Texas Education Agency, Introduction to the Revised Mathematics TEKS Vertical Alignment Chart by TEA, Vertical Alignment Chart by TEA, Texas Response to Curriculum Focal Points for Kindergarten through Grade 8 Mathematics by TEA, Next Generation Science Standards by Achieve, Inc., and numerous math practitioners currently in the classroom.

We hope you will find this concentrated and consolidated resource of value in your own planning. We encourage you to use this resource to facilitate discussion with your colleagues and, perhaps, as a lever to help assess targeted professional learning opportunities.

Understanding the Organization

The organization and structure of the Math TEKS has been broken down into specific sections to facilitate use of the Deconstructed Standards. First, there are the Introduction Statements. This section covers the background and historical information about the TEKS, how process standards are interwoven into TEKS, the primary focal points (Strands) for the grade level and what will be taught, and a description of wording for content (mastered vs. possible illustrative examples). Second, there are the Mathematical Process Standards. These standards are essential to success in college and careers. Real-world problem solving is critical in preparing students to be successful in college and careers. Effective real-world problems are multi-faceted and involve the problem-solving process, selecting appropriate tools in order to successfully solve problems, and communicating the problem-solving process with precise mathematical language. Finally, the Readiness Standards identify the TEKS that are critical for success in the current and subsequent grades and college and careers. These standards require in-depth instruction and address significant content and concepts.

The math TEKS are divided into content strands.

MATH STRANDS	
Elementary	• Number and Operations (K-8) • Algebraic Reasoning (K-5, Precalculus) • Geometry and Measurement (K-5) • Data Analysis (K-5) • Personal Financial Literacy (K-8)
Middle School	• Numbers and Operations (K-8) • Proportionality (6-8) • Expressions, Equations, and Relationships (6-8) • Measurement and Data (6-8) • Two-dimensional Shapes (8) • Personal Financial Literacy (K-8)
High School	
Algebra I & II	• Linear Functions, Equations, and Inequalities (Algebra I) • Quadratic Functions and Equations (Algebra I) • Exponential Functions and Equations (Algebra I) • Number and Algebraic Methods (Algebra I & II) • Attributes of Functions and Their Inverses (Algebra II) • Systems of Equations and Inequalities (Algebra II) • Quadratic and Square Root Functions, Equations, and Inequalities (Algebra II) • Exponential and Logarithmic Functions and Equations (Algebra II) • Cubic, Cube Root, Absolute Value and Rational Functions, Equations, and Inequalities (Algebra II) • Data (Algebra II)

MATH STRANDS (Continued)	
Geometry	• Coordinate and Transformational Geometry • Logical Argument and Construction • Proof and Congruence • Similarity, Proof, and Trigonometry • Two-dimensional and Three-dimensional Figures • Circles • Probability
Precalculus	• Functions • Relations and Geometric Reasoning • Number and Measure • Algebraic Reasoning

When reading through the Deconstructed Standards, think of the strand as a sort of header. The content will reflect standards-focused information within that strand. Within each Strand are the *Knowledge and Skills Statements* associated with that strand. The Knowledge and Skill Statements provide a description of what students know and will be learning. The *Knowledge and Skills Statements* are identified by a grade level followed by a number (e.g., 3.4 represents 5th grade, fourth *Knowledge and Skills Statement*). There are three key sections for each Knowledge and Skill Statement: *Big Idea*, *Academic Vocabulary*, and *Connections*. The *Big Idea* captures the essence for this particular *Knowledge and Skills Statement* (e.g., Number and Operation, Geometry and Measurement, etc.). Think of this as an overarching guiding concept. *Academic Vocabulary* supports the *Big Idea* and is meant to help distinguish some of the specific *Academic Vocabulary* students will encounter. Each Knowledge and Skill Statement is then connected to the Texas College and Career Readiness Standards, Next Generation Science Standards, and Science, Technology, Engineering and Mathematics (STEM).* Integrating these *Connections* into each Knowledge and Skill Statement is essential in preparing students for college, careers, and life in the 21st Century.

Moving deeper and more explicitly into the *Knowledge and Skills Statement* are then the *Student Expectations* which are indicated by a letter. Each *Student Expectation* is then deconstructed in order to provide additional guidance and insight for instructional planning. The deconstruction of the *Student Expectation* includes *Essential Question(s)*, *Vertical Articulation*, *Instructional Targets*, and specific *Examples*.

The *Essential Question(s)* amplify the *Big Idea* with the intent of taking you to a deeper level of understanding; they may also provide additional context for the *Academic Vocabulary*.

Vertical Articulations, which are contextually based upon the current standard with bracketed grade-level standards for the preceding and following grades, are included to allow for focused planning. This helps remind you of the proficiency level of your students as they enter your grade and the proficiency expectations for the next grade.

The *Instructional Targets* express the student learning targets for student proficiency for *KNOW, THINK,* and *DO*, as appropriate. In some instances, there may be no Learning Targets for student proficiency for one or more of *KNOW, THINK* or *DO*. The Learning Targets are expressions of the deconstruction of the *Student Expectation* with appropriate consideration of the *Essential Questions*.

The last section of the Deconstructed Standards includes *Examples*. This section might be quite lengthy as it can include additional context for the *Student Expectation* itself as well as *Examples* of what student work and student learning could look like. *Examples* may offer ideas for instructional practice and lesson plans.

**See Appendix for grade-specific list of the Texas College and Career Readiness Standards and complete grade-specific list of Next Generation Science Standards.*

The examples that we are utilizing come from one of our educational partners, Triumph Learning. Triumph Learning, LLC, is a leading educational content company, trusted by K-12 educators in more than 42,000 schools since 1985 to deliver standards-based products and services that accelerate student proficiency in math, English language arts, science, and social studies. Triumph Learning publishes print and digital resources, standards-aligned instructional materials, and effective literacy programs, including uniquely customized products, and has an established record of success in improving student achievement and increasing teacher effectiveness.

Introduction to Grade 5

1. The desire to achieve educational excellence is the driving force behind the Texas Essential Knowledge and Skills for mathematics, guided by the College and Career Readiness Standards. By embedding statistics, probability, and finance, while focusing on computational thinking, mathematical fluency, and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

2. The process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, algorithms, paper and pencil, and technology and techniques such as mental math, estimation, number sense, and generalization and abstraction to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, computer programs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

3. For students to become fluent in mathematics, students must develop a robust sense of number. The National Research Council's report, "Adding It Up," defines procedural fluency as "skill in carrying out procedures flexibly, accurately, efficiently, and appropriately." As students develop procedural fluency, they must also realize that true problem solving may take time, effort, and perseverance. Students in Grade 5 are expected to perform their work without the use of calculators.

4. The primary focal areas in Grade 5 are solving problems involving all four operations with positive rational numbers, determining and generating formulas and solutions to expressions, and extending measurement to area and volume. These focal areas are supported throughout the mathematical strands of Number and Operations, Algebraic reasoning, Geometry and Measurement, and Data Analysis. In Grades 3-5, the number set is limited to positive rational numbers. In Number and Operations, students will apply place value and identify part-to-whole relationships and equivalence. In Algebraic Reasoning, students will represent and solve problems with expressions and equations, build foundations of functions through patterning, identify prime and composite numbers, and use the order of operations. In Geometry and Measurement, students will classify two-dimensional figures, connect geometric attributes to the measures of three-dimensional figures, use units of measure, and represent location using a coordinate plane. In Data Analysis, students will represent and interpret data.

5. Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

Mathematical Process Standards

5.1 The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

A. apply mathematics to problems arising in everyday life, society, and the workplace.

B. use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.

C. select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.

D. communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.

E. create and use representations to organize, record, and communicate mathematical ideas.

F. analyze mathematical relationships to connect and communicate mathematical ideas.

G. display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(Source: Texas Education Agency, www.tea.state.tx.us)

Snapshot of TEKS that are most critical for STAAR

5.2	The student applies mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value.
The student is expected to:	5.2(B) compare and order two decimals to thousandths and represent comparisons using the symbols >, <, or =.
5.3	The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy.
The student is expected to:	5.3(E) solve for products of decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers. 5.3(G) solve for quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using strategies and algorithms, including the standard algorithm. 5.3(K) add and subtract positive rational numbers fluently. 5.3(L) divide whole numbers by unit fractions and unit fractions by whole numbers.
5.4	The student applies mathematical process standards to develop concepts of expressions and equations.
The student is expected to:	5.4(B) represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity. 5.4(C) generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph. 5.4(F) simplify numerical expressions that do not involve exponents, including up to two levels of grouping. 5.4(H) represent and solve problems related to perimeter and/or area and related to volume.
5.5	The student applies mathematical process standards to classify two-dimensional figures by attributes and properties. The student is expected to classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.
5.8	The student applies mathematical process standards to identify locations on a coordinate plane.
The student is expected to:	5.8(C) graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table.
5.9	The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data.
The student is expected to:	5.9(C) solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot.

STRAND:

NUMBER & OPERATIONS

FIFTH GRADE MATHEMATICS

KNOWLEDGE & SKILL STATEMENT	Key Idea
	5.3 The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy.

BIG IDEA	Understanding of basic facts and algorithms for all operations allows for the fluency needed to solve real-world problems efficiently and with precision.

ACADEMIC VOCABULARY	addition/add and sum, area models, decimals (tenth, hundredths, thousandths), digit, division/divide/dividend/divisor and quotient, estimate, fluency, fractions and unit fractions, money, multiplication/multiply and product, numerator and denominator, objects and pictorial models, place value, positive rational numbers, properties of operations, solve, standard algorithm, strategies, subtraction/subtract and difference, whole numbers

CONNECTIONS

Texas College & Career Readiness Standards	**All Standards for Grade 5*** ** See Appendix for complete list.*
STEM (Science, Technology, Engineering and Math)	Determine the grid coordinates of a point on a military map. Discuss scale. Create word problems around map. http://www.armystudyguide.com/content/Prep_For_Basic_Training/Prep_for_basic_land_navigation/determine-the-grid-coordi.shtml Students ride bicycles down the sidewalk a short, specific distance. Draw a chalk line or use a marker such as a tree or a sign to show where to stop. Ask students to estimate how many times their bicycle wheel went around. Use a string to find the circumference of the different bicycle wheels. Cut the string so that it reflects the measurement of the circumference of the tire. Use the circumference formula and measurements to find the circumferences. Next, measure the distance the bicycle wheel traveled to the nearest inch. Use mathematic reasoning and calculations to determine the number of times the bicycle wheel went around. (Try with basketballs, hula hoops, etc. if bicycles are not available.) Interactive games: http://www.math-play.com/5th-grade-math-games.html
Next Generation Science Standards	**5-PS1-3 Matter and Its Interactions** Make observations and measurements to identify materials based on their properties. **5-ESS1-1 Earth's Place in the Universe** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. **5-ESS2-2 Earth's Systems** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

KNOWLEDGE & SKILL STATEMENT 5.3	The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy.

STUDENT EXPECTATIONS

5.3(E)	The student is expected to solve for products of decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers.
ESSENTIAL QUESTION(S)	• How can money be used to solve for products of decimals to the hundredths?

VERTICAL ARTICULATION

	Grade	Student Expectation
Number & Operations	4th	
	5th	5.3(E) solve for products of decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers.
	6th	6.3(E) multiply and divide positive rational numbers fluently.

Instructional Targets:	Know: Concepts/Skills	Think	Do
Students should be able to:	Solve products of decimals to the hundredths.	Apply strategies based on place value to products of decimals to the hundredths that include situations involving money.	

EXAMPLE(S)

Joaquin has a special mountain bike that weighs only 16.25 pounds. Rhonda says her bike weighs 2.5 times as much as Joaquin's bike. How much does Rhonda's bike weigh?

A. 40.625 pounds
B. 42.625 pounds
C. 405.25 pounds
D. 406.25 pounds

Answer: A

KNOWLEDGE & SKILL STATEMENT 5.3	The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy.

STUDENT EXPECTATIONS

5.3(F)	The student is expected to represent quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using objects and pictorial models, including area models.
ESSENTIAL QUESTION(S)	• What models, objects, and pictures can be used to represent quotients of decimals to the hundredths?

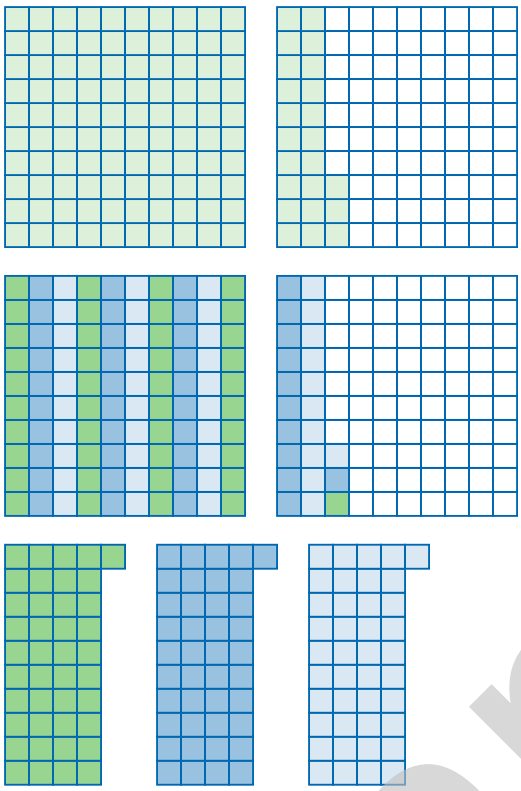
VERTICAL ARTICULATION

	Grade	Student Expectation
Number & Operations	4th	
	5th	5.3(F) represent quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using objects and pictorial models, including area models.
	6th	6.3(E) multiply and divide positive rational numbers fluently.

Instructional Targets:	Know: Concepts/Skills	Think	Do
Students should be able to:	Know quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors.	Employ objects and pictorial models for quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors.	

EXAMPLE(S)

Which division computation do these models show?



A. $\frac{1.23}{3}$

B. $\frac{12.3}{3}$

C. $\frac{123}{3}$

D. $\frac{1.23}{2}$

Answer: A

STRAND:

ALGEBRAIC REASONING

FIFTH GRADE MATHEMATICS

KNOWLEDGE & SKILL STATEMENT	Key Idea
	5.4 The student applies mathematical process standards to develop concepts of expressions and equations.

BIG IDEA	Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations so solutions can be found.

ACADEMIC VOCABULARY	area, concrete objects and pictorial models, cube, equations, exponents, formulas, graph, multi-step problems, numeric/numerical expressions (parentheses, brackets), numerical patterns (additive, multiplicative), perimeter, prime and composite numbers, properties of operations, rectangular prism, rule, solve, table, volume, whole numbers

CONNECTIONS

Texas College & Career Readiness Standards	**All Standards for Grade 5*** ** See Appendix for complete list.*

STEM (Science, Technology, Engineering and Math)	Using a cardboard box (less than one cubic foot), waxed paper, masking tape, newspaper, aluminum foil, and a rubber band make a container to see how long you can keep an ice cube from melting. Calculate volume of container. Find out what works best to keep the heat away from the ice cube. Put ice cube in the container. Take another ice cube and don't put it in a Keep-a-Cube container. It will be your control. In 90 minutes, check both ice cubes. If at the end of 90 minutes the control ice cube is the same size as the ice cube in your Keep-a-Cube container, the container didn't do much to keep the ice cube from melting. For full lesson, video, and student responses, go to http://pbskids.org/zoom/activities/sci/keepacube.html. Students ride bicycles down the sidewalk a short, specific distance. Draw a chalk line or use a marker such as a tree or a sign to show where to stop. Ask students to estimate how many times their bicycle wheel went around. Use a string to find the circumference of the different bicycle wheels. Cut the string so that it reflects the measurement of the circumference of the tire. Use the circumference formula and measurements to find the circumferences. Next, measure the distance the bicycle wheel traveled to the nearest inch. Use mathematic reasoning and calculations to determine the number of times the bicycle wheel went around. (Try with basketballs, hula hoops, etc. if bicycles are not available.)

Next Generation Science Standards	**5-PS3-1 Energy** Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. **5-ESS1-1 Earth's Place in the Universe** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. **5-ESS2-2 Earth's Systems** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

KNOWLEDGE & SKILL STATEMENT 5.4	The student applies mathematical process standards to develop concepts of expressions and equations.

STUDENT EXPECTATIONS

5.4(B) The student is expected to represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.

ESSENTIAL QUESTION(S)

- What is the most efficient strategy to solve multi-step problems using the four operations, whole numbers, and a letter as the unknown quantity?

VERTICAL ARTICULATION

	Grade	Student Expectation	
Algebraic Reasoning	4th	4.5(A)	represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity.
	5th	5.4(B)	represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.
	6th	6.7(B)	distinguish between expressions and equations verbally, numerically, and algebraically.
		6.10(A)	model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts.
		6.10(B)	determine if the given value(s) make(s) one-variable, one-step equations or inequalities true.

Instructional Targets:	Know: Concepts/Skills	Think	Do
Students should be able to:	Use the four operations with whole numbers to express multi-step problems.	Use the four operations with whole numbers to solve multi-step problems.	Use equations with a letter standing for the unknown quantity to express and solve multi-step problems involving the four operations with whole numbers.

EXAMPLE(S)

A total of 136 girls are trying out for cheerleading teams. Each team will have 12 cheerleaders. What is the largest number of teams that can be made?

A. 4
B. 10
C. 11
D. 12

Answer: C

KNOWLEDGE & SKILL STATEMENT 5.4	The student applies mathematical process standards to develop concepts of expressions and equations.

STUDENT EXPECTATIONS

5.4(C)	The student is expected to generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph.
ESSENTIAL QUESTION(S)	• How can a rule in algebraic form be used to generate a numerical pattern?

VERTICAL ARTICULATION

	Grade	Student Expectation	
Algebraic Reasoning	4th	4.5(B)	represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence.
	5th	5.4(C)	generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph.
	6th	6.4(A)	compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships.

Instructional Targets:	Know: Concepts/Skills	Think	Do
Students should be able to:		Create a numerical pattern using the rule $y = ax$ or $y = a + x$.	Graph a numerical pattern using the rule $y = ax$ or $y = a + x$.

EXAMPLE(S)

For the equation $y = 2x + 4$, which table shows the relationship between x and y?

A.

x	2	4	7	10
y	8	12	18	24

B.

x	2	4	7	10
y	8	10	12	14

C.

x	2	4	7	10
Y	10	14	18	22

D.

x	2	4	7	10
y	14	12	10	8

Answer: A

STRAND:

GEOMETRY & MEASUREMENT

FIFTH GRADE MATHEMATICS

KNOWLEDGE & SKILL STATEMENT	Key Idea
	5.8 The student applies mathematical process standards to identify locations on a coordinate plane.

BIG IDEA	Lines, angles, and geometric shapes can have an infinite number of locations within a plane that can be described quantitatively.

ACADEMIC VOCABULARY	attributes, axes and axis, coordinate plane, coordinate, graph, input-output table, intersection, lines, number line, number patterns, ordered pair, origin, parallel and perpendicular number lines, quadrant

CONNECTIONS

Texas College & Career Readiness Standards	**All Standards for Grade 5*** ** See Appendix for complete list.*
STEM (Science, Technology, Engineering and Math)	Introduce students to graphing ordered pairs of numbers on the coordinate plane using the interactive game: http://www.shodor.org/interactivate/lessons/GraphingCoordinate/. Determine the grid coordinates of a point on a military map. Discuss scale. Create word problems around map. http://www.armystudyguide.com/content/Prep_For_Basic_Training/Prep_for_basic_land_navigation/determine-the-grid-coordi.shtml
Next Generation Science Standards	**5-PS1-2 Matter and Its Interactions** Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. **5-LS2-1 Ecosystems: Interactions, Energy and Dynamics** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. **5-ESS1-2 Earth's Place in the Universe** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. **5-ESS2-2 Earth's Systems** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

KNOWLEDGE & SKILL STATEMENT 5.8	The student applies mathematical process standards to identify locations on a coordinate plane.

STUDENT EXPECTATIONS

5.8(A)	The student is expected to describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0, 0); the *x*-coordinate, the first number in an ordered pair, indicates movement parallel to the *x*-axis starting at the origin; and the *y*-coordinate, the second number, indicates movement parallel to the *y*-axis starting at the origin.
ESSENTIAL QUESTION(S)	• What are the parts of the coordinate system?

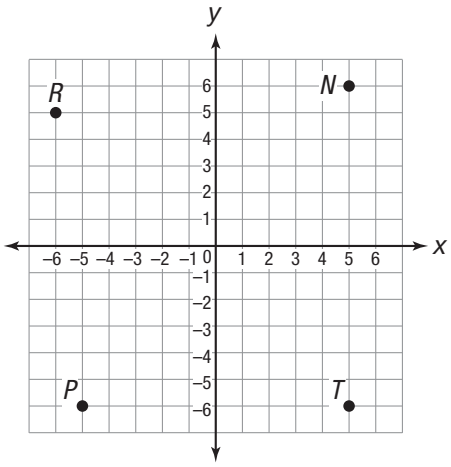
VERTICAL ARTICULATION

	Grade	Student Expectation	
Geometry & Measurement	4th		
	5th	5.8(A)	describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0, 0); the *x*-coordinate, the first number in an ordered pair, indicates movement parallel to the *x*-axis starting at the origin; and the *y*-coordinate, the second number, indicates movement parallel to the *y*-axis starting at the origin.
	6th	6.11	graph points in all four quadrants using ordered pairs of rational numbers.

Instructional Targets:	Know: Concepts/Skills	Think	Do
Students should be able to:	Define coordinate plane key attributes (axes, origin) using the number line as a reference. Describe *x* and *y* coordinates.		

EXAMPLE(S)

Which point is located at (−5, −6)?



A. point *N*
B. point *P*
C. point *R*
D. point *T*

Answer: B

KNOWLEDGE & SKILL STATEMENT 5.8	The student applies mathematical process standards to identify locations on a coordinate plane.

STUDENT EXPECTATIONS

5.8(B)	The student is expected to describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane.
ESSENTIAL QUESTION(S)	• How can I represent the location of an object within a coordinate plane?

VERTICAL ARTICULATION

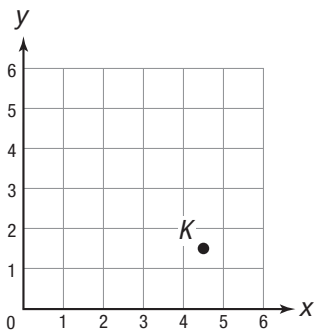
	Grade	Student Expectation
Geometry & Measurement	4th	
	5th	5.8(B) describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane.
	6th	6.11 graph points in all four quadrants using ordered pairs of rational numbers.

Instructional Targets:	Know: Concepts/Skills	Think	Do
Students should be able to:	Identify the first quadrant of a coordinate plane.	Show the graphing of ordered pairs of numbers in the first quadrant of the coordinate plane.	

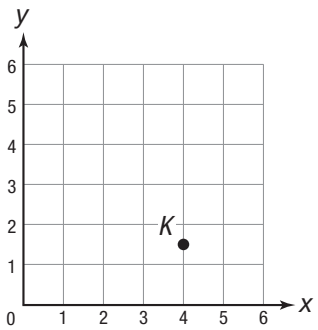
EXAMPLE(S)

Which graph shows point K at (4.5, 1.5)?

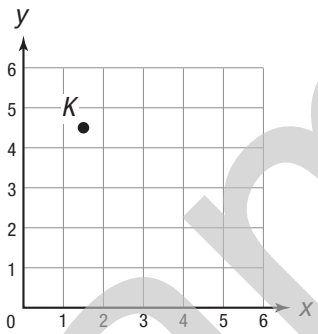
A.



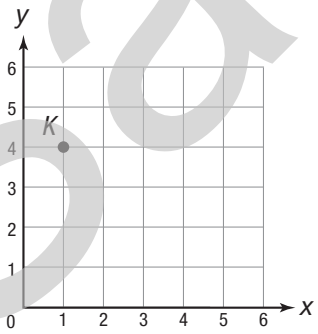
B.



C.



D.



Answer: A