

STAAR CONNECTION™

Diagnostic Series™

Math
5
teacher
v2



KAMICO®
Instructional Media, Inc.

STAAR CONNECTION™

Math
5
teacher

Diagnostic Series™

XXVIII/i/MMXXII
Version 2



KAMICO®

Instructional Media, Inc.

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KAMICO® Instructional Media, Inc.
STAAR CONNECTION™
Introduction

KAMICO® Instructional Media's program is validated by scientifically based research. **STAAR CONNECTION™ Diagnostic Series™** and **Developmental Series™** can be used in tandem to ensure mastery of Texas reporting categories and TEKS. The *Diagnostic Series™* consists of a bank of assessments. Each assessment covers a mixture of reporting categories and TEKS. This research-based format provides continual reinforcement for and ensures retention of mastered concepts. To take full advantage of this series, administer an assessment to students. After they have completed the assessment, use it as an instructional tool. Go over each item with the class, discussing all correct and incorrect answers. Then, use the assessment as a diagnostic tool to determine a standard for which students need remediation. Find that standard in the *Developmental Series™*.

Each book in the *STAAR CONNECTION Developmental Series™* consists of isolated activities and assessments to allow for the development of specific TEKS. For every TEKS, there is at least one individual or group activity. The activities provide a fun, challenging, yet nonthreatening, way to develop mastery of the TEKS. In addition to these activities, each *Developmental Series™* book has assessments on isolated standards to be used to identify mastery or the need for further skill development or reinforcement. Continue to alternate between the *STAAR CONNECTION™ Diagnostic Series™* and the *Developmental Series™*.

KAMICO's **DATA CONNECTION®** software prints student answer sheets on plain paper using a standard laser printer, scans answer sheets using a TWAIN-compliant scanner, scores assessments, and disaggregates student academic data, showing which goals and objectives are mastered and which goals and objectives are in need of reinforcement. The software is preprogrammed to work with all KAMICO® assessments. It is easily customized to work with other instructional materials and assessments as well as teacher-, school-, district-, or state-created assessments. **DATA CONNECTION®** analyzes academic data from individual students, classes, grade levels, and demographic groups. Reports are presented in tabular and graphic form. Item analysis is provided to help determine the most effective method of instruction.

KAMICO® Instructional Media, Inc., supports efforts to ensure adequate yearly progress and eliminate surprises in high-stakes test results.

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STAAR CONNECTION™
Diagnostic Series™
Grade 5 Math
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Reporting Categories and Related TEKS Grade 5 Mathematics

Mathematical Process Standards

These student expectations will not be listed under a separate reporting category. Instead, they will be incorporated into test questions across reporting categories since the application of mathematical process standards is part of each knowledge statement.

- (5.1) **Mathematical process standards.** 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; and
 - (G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Reporting Category 1: Numerical Representations and Relationships

The student will demonstrate an understanding of how to represent and manipulate numbers and expressions.

- (5.2) **Number and operations.** 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
- (A) represent the value of the digit in decimals through the thousandths using expanded notation and numerals; **Supporting Standard**
 - (B) compare and order two decimals to thousandths and represent comparisons using the symbols $>$, $<$, or $=$; and **Readiness Standard**
 - (C) round decimals to tenths or hundredths. **Supporting Standard**
- (5.4) **Algebraic reasoning.** The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to
- (A) identify prime and composite numbers; **Supporting Standard**
 - (E) describe the meaning of parentheses and brackets in a numeric expression; and **Supporting Standard**
 - (F) simplify numerical expressions that do not involve exponents, including up to two levels of grouping. **Readiness Standard**

Reporting Category 2: Computations and Algebraic Relationships

The student will demonstrate an understanding of how to perform operations and represent algebraic relationships.

- (5.3) **Number and operations.** 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
- (A) estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division; **Supporting Standard**
 - (B) multiply with fluency a three-digit number by a two-digit number using the standard algorithm; **Supporting Standard**
 - (C) solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm; **Supporting Standard**
 - (D) represent multiplication of decimals with products to the hundredths using objects and pictorial models, including area models; **Supporting Standard**
 - (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; **Readiness Standard**
 - (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; **Supporting Standard**
 - (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; **Readiness Standard**
 - (H) represent and solve addition and subtraction of fractions with unequal denominators referring to the same whole using objects and pictorial models and properties of operations; **Supporting Standard**
 - (I) represent and solve multiplication of a whole number and a fraction that refers to the same whole using objects and pictorial models, including area models; **Supporting Standard**

- (J) represent division of a unit fraction by a whole number and the division of a whole number by a unit fraction such as $1/3 \div 7$ and $7 \div 1/3$ using objects and pictorial models, including area models; **Supporting Standard**
 - (K) add and subtract positive rational numbers fluently; and **Readiness Standard**
 - (L) divide whole numbers by unit fractions and unit fractions by whole numbers. **Readiness Standard**
- (5.4) **Algebraic reasoning.** The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to
- (B) represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity; **Readiness Standard**
 - (C) generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph; and **Readiness Standard**
 - (D) recognize the difference between additive and multiplicative numerical patterns given in a table or graph. **Supporting Standard**

Reporting Category 3: Geometry and Measurement

The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.

- (5.4) **Algebraic reasoning.** The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to
- (H) represent and solve problems related to perimeter and/or area and related to volume. **Readiness Standard**
- (5.5) **Geometry and measurement.** The student applies mathematical process standards to classify two-dimensional figures by attributes and properties. The student is expected to
- (A) classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties. **Readiness Standard**
- (5.6) **Geometry and measurement.** The student applies mathematical process standards to understand, recognize, and quantify volume. The student is expected to
- (A) recognize a cube with side length of one unit as a unit cube having one cubic unit of volume and the volume of a three-dimensional figure as the number of unit cubes (n cubic units) needed to fill it with no gaps or overlaps if possible; and **Supporting Standard**
 - (B) determine the volume of a rectangular prism with whole number side lengths in problems related to the number of layers times the number of unit cubes in the area of the base. **Supporting Standard**
- (5.7) **Geometry and measurement.** The student applies mathematical process standards to select appropriate units, strategies, and tools to solve problems involving measurement. The student is expected to
- (A) solve problems by calculating conversions within a measurement system, customary or metric. **Supporting Standard**

- (5.8) **Geometry and measurement.** The student applies mathematical process standards to identify locations on a coordinate plane. The student is expected to
- (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; **Supporting Standard**
 - (B) describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane; and **Supporting Standard**
 - (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. **Readiness Standard**

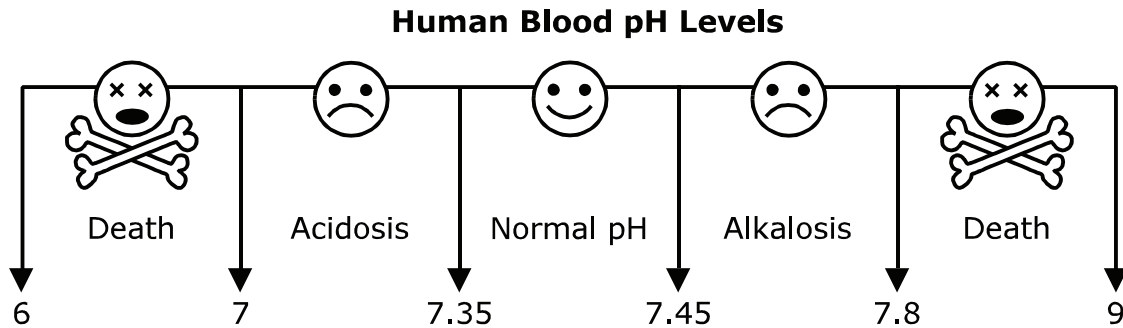
Reporting Category 4: Data Analysis and Personal Financial Literacy

The student will demonstrate an understanding of how to represent and analyze data and how to describe and apply personal financial concepts.

- (5.9) **Data analysis.** The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to
- (A) represent categorical data with bar graphs or frequency tables and numerical data, including data sets of measurements in fractions or decimals, with dot plots or stem-and-leaf plots; **Supporting Standard**
 - (B) represent discrete paired data on a scatterplot; and **Supporting Standard**
 - (C) solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot. **Readiness Standard**
- (5.10) **Personal financial literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to
- (A) define income tax, payroll tax, sales tax, and property tax; **Supporting Standard**
 - (B) explain the difference between gross income and net income; **Supporting Standard**
 - (E) describe actions that might be taken to balance a budget when expenses exceed income; and **Supporting Standard**
 - (F) balance a simple budget. **Supporting Standard**

Name _____ Date _____

- 1 On the pH scale, the normal range of human blood is from 7.35 to 7.45.



Once the blood pH is outside of that range, a human can become very ill. If the pH level of the blood drops below 7 or rises above 7.8, death can occur. A 7.45 pH is the upper level of normal for human blood. How is 7.45 written in expanded notation?

- A** $7.45 = (7 \times 1) + (4 \times \frac{1}{10}) + (5 \times \frac{1}{100})$
- B** $7.45 = (7 \times \frac{1}{10}) + (4 \times \frac{1}{10}) + (5 \times \frac{1}{100})$
- C** $7.45 = 7 + 0.45 + 0.05$
- D** 7.45

2 Kayne and his parents are traveling to his grandparents' house for Christmas. When they first left home, the roads were icy, so they could drive only 30 miles per hour for the first 2 hours of the trip. Road conditions greatly improved, and the next 3 hours were traveled at an average speed of 60 miles per hour. After traveling for these 5 hours, they stopped and spent $1\frac{1}{2}$ hours in a restaurant before continuing the drive. If the distance from Kayne's house to his grandparents' house is 280 miles, how many more miles does Kayne's family have to travel after leaving the restaurant?

F The expression $280 - [(2 \times 30) + (3 \times 60)]$ can be used to find the remaining distance to Kayne's grandparents' house. To solve the expression, first multiply 2 and 30, and then subtract the product from 280. Next multiply 3 and 60. Add the two numbers, the sum of which gives the number of miles remaining.

G The expression $280 - [(2 \times 30) + (3 \times 60) + 1\frac{1}{2}]$ can be used to find the remaining distance to Kayne's grandparents' house. To solve the expression, multiply 2 and 30. Next multiply 3 and 60. Now add these products. Subtract the sum from 280 to find the number of miles remaining.

H The expression $280 - [(2 + 3 + 1\frac{1}{2}) \times \frac{(30 + 60)}{2}]$ can be used to find the remaining distance to Kayne's grandparents' house. To solve the expression, first add 2, 3, and $1\frac{1}{2}$. Next add 30 and 60. Next multiply the sum of 2, 3, and $1\frac{1}{2}$ by the sum of 30 and 60. Divide the result by 2. Subtract that result from 280 to find the number of miles remaining.

J The expression $280 - [(2 \times 30) + (3 \times 60)]$ can be used to find the remaining distance to Kayne's grandparents' house. To solve the expression, first multiply 2 and 30. Next multiply 3 and 60. Add these two products. Then, subtract that sum from 280 to find the number of miles remaining.

Bonus: Solve to find how many more miles Kayne's family has left to travel after leaving the restaurant. _____

- 3** Carlos plans to cook breakfast for his parents' anniversary. He has the following chopped ingredients.

Chopped Ingredients	
$\frac{3}{4}$	cup mushrooms
$\sim \frac{1}{4}$	cup black olives
$1\frac{1}{3}$	cups green bell peppers
~ 1	cup sweet onions
$\sim 1\frac{3}{4}$	cups cheese
1	cup ham

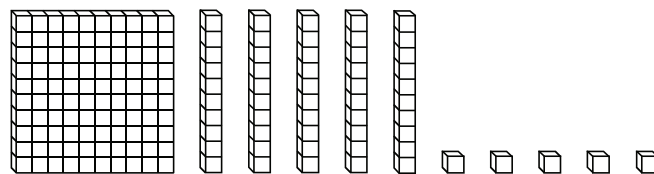
\sim = approximately



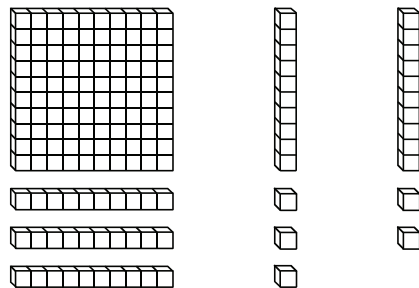
Estimate the number of cups of ingredients that Carlos has. (Hint: Round all measurements to the nearest cup.)

- A** 4 c
- B** 5 c
- C** 6 c
- D** $6\frac{1}{12}$ c

- 4 Susan owns a bakery. She sells doughnuts in sacks by the baker's dozen, which is a quantity of 13. Her best-selling product is a baker's dozen sack of glazed doughnuts for \$10. A baker's dozen sack of chocolate doughnuts is \$12, and a baker's dozen sack of iced doughnuts with sprinkles is \$13. She sells single glazed doughnuts for \$1 each, chocolate doughnuts for \$1.25 each, and iced doughnuts with sprinkles for \$1.45 each. Susan usually makes 160 glazed doughnuts, 120 chocolate doughnuts, and 100 iced doughnuts with sprinkles each morning. This morning, Susan makes 155 glazed doughnuts. Use the model to determine what her glazed doughnut sales amount will be if she sells as many baker's dozen sacks as possible and if she sells all the glazed doughnuts she makes this morning.



$$155 \div 13$$



$$\begin{array}{r}
 (10 \times 13) + (1 \times 13) + 12 \\
 130 + 13 + 12 \\
 143 + 12 \\
 155
 \end{array}$$

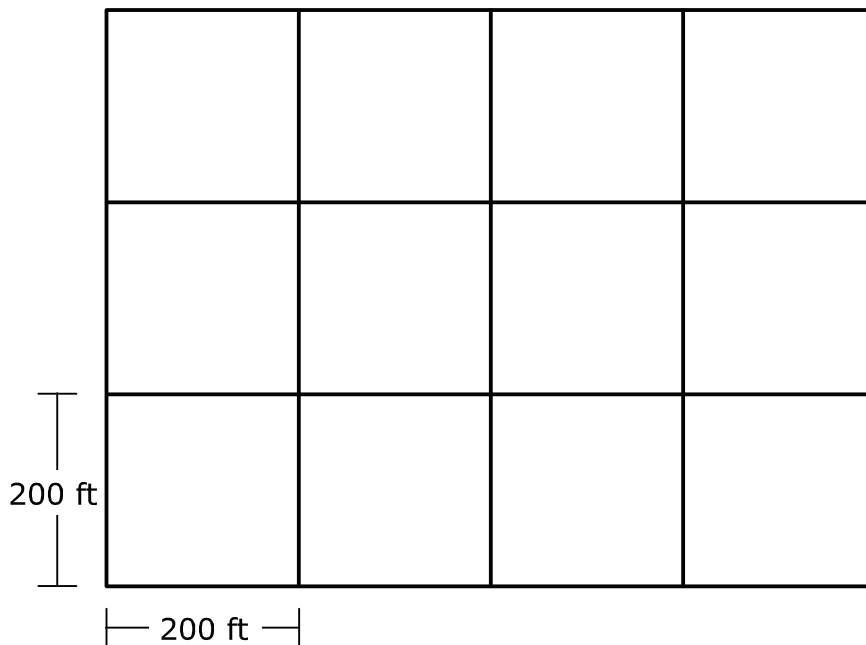
Susan's glazed doughnut sales will total —

- F** \$122
- G** \$124
- H** \$131
- J** Not Here

- 5 Quan's mom is planting wildflower seeds in her front pasture.

Coverage	1 Pound of Seed
lush stand (almost solid flowers)	1,500 sq ft
acreage display (good coverage)	2,000 sq ft
meadow look (scattered flowers)	4,000 sq ft

The diagram represents the pasture that Quan's mom will be planting with wildflower seeds.



How many pounds of wildflower seed will Quan's mom need for good coverage of the pasture?

- A 2.4 lb
- B 20 lb
- C 200 lb
- D 240 lb

- 6** Jill is taking an auto mechanics class. One of the skills the students learn in the class is how to change oil in a vehicle. After the process is modeled for them, students change the oil in two vehicles. Jill works on a 2010 pickup and a 2012 sedan. The pickup takes 6 quarts of oil, and the sedan takes $3\frac{9}{10}$ quarts of oil. How many cups of oil will Jill need in order to change the oil in the pickup?

F $3\frac{9}{10}$ c

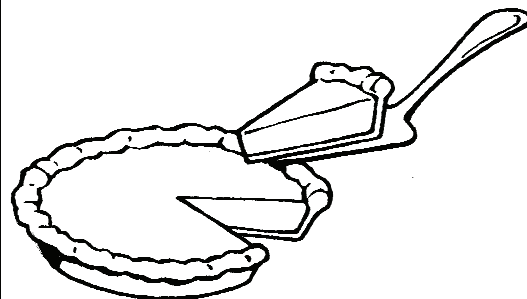
G 4 c

H $15\frac{3}{5}$ c

J 24 c

- 7 Marty was injured in a bicycle accident. He needs physical therapy, but he cannot afford it. Marty's friend Gabriel organizes a pie-eating contest to raise money to help pay for the physical therapy. People in the community provide pies for the contest. The contestants eat as many slices of pie as they can. Sponsors pay according to the number of slices of pie the contestants eat. Following is a table showing the number of slices of pie each contestant was able to eat.

Contestant	Number of Slices of Pie
Shelby	10
Aria	16
Grady	3
Henry	11
Ryan	23
Samantha	26
Makayla	14
Luke	42
Sophia	20
Shortie	11
Jayce	24



Which stem-and-leaf plot accurately represents the number of slices of pie the contestants ate?

A

Slices of Pie	
Stem	Leaf
0	3
1	0 1 1 4 6
2	0 3 4 6
4	2

C

Slices of Pie	
Stem	Leaf
0	3
1	0 1 1 4 6
2	0 3 4 6
3	0
4	2

B

Slices of Pie	
Stem	Leaf
1	0 1 1 4 6
2	0 3 4 6
3	
4	2

D

Slices of Pie	
Stem	Leaf
1	0 1 1 4 6
2	0 3 4 6
3	0
4	2

- 8** George keeps hearing on the news about balancing the budget. He agrees that balancing the national budget is important. George wants to begin keeping a budget. He wants to develop the habit at a young age. If he does so, he can become financially secure as he gets older. He also wants to use a budget to help him save for a scooter. George starts to prepare his budget by tracking his monthly spending.

Expenses Last Month	
Snacks	\$ 18
Movies	20
Club Dues	15
Baseball Glove	30
Baseball Cards	18
Total Expenses	\$101

At the end of the month, George looks over his expenses. He sees that if he wants to balance his budget, he will have to either cut his spending or increase his income. Currently, he makes \$80 a month mowing lawns. Which of the following strategies could George use to balance his budget?

- F** George could spend \$1 less a month on snacks.
- G** George could forget about trying to save for a scooter. He could leave financial concerns for a later time and just enjoy his childhood.
- H** George could use the money he spends on baseball cards to put into savings each month. In addition, he could add another \$25 a month to his income by mowing more lawns.
- J** George could balance his budget by asking his mom if he could quit mowing lawns and spend his time playing baseball instead.

- 9** Caffeine is found naturally in chocolate, coffee, and tea. It is added to some foods and drinks. Caffeine can interfere with sleep, make the heart beat faster, cause headaches, and make people dehydrated. Too much caffeine can be life threatening.

The United States Food and Drug Administration (FDA) states that moderate amounts of caffeine (100 to 200 milligrams per day for adults) are safe. Regular coffee has between 60 and 150 milligrams of caffeine per 5-ounce serving, depending on how it is brewed. One type of energy drink has 140 milligrams of caffeine per serving. One type of energy booster has 422 milligrams of caffeine per 1.93-ounce serving. How many grams of caffeine would be consumed over 30 days if a person drank one 5-ounce cup of coffee containing 30 milligrams of caffeine per ounce each of those 30 days?

- A** 0.15 g
- B** 4.5 g
- C** 150 g
- D** Not Here

- 10** Giraffes are the tallest living mammals that live on land. Giraffe legs can be 1.8 meters long, which is taller than many people. If a newborn giraffe is 1.8 meters tall, an adult female giraffe is 4.6 meters tall, and an adult male giraffe is 5.2 meters tall, how many centimeters taller is an adult female giraffe than the newborn?

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

Student
Name:

STAAR CONNECTION™
Grade 5
Diagnostic Series Math

The following charts provide the correct answer to each assessment question, along with the corresponding reporting category, identification of readiness or supporting standard, content student expectation, and process student expectation.

Circle the number of any question that has been answered incorrectly. Circle the TEKS that need additional reinforcement.

Assessment 1					
Item Number	Correct Answer	Reporting Category	Readiness or Supporting	Content Student Expectation (TEKS)	Process Student Expectation (TEKS)
1	A	1	Supporting	5.2A	5.1D
2	J	1	Readiness	5.4F	5.1G
3	C	2	Supporting	5.3A	5.1C
4	F	2	Readiness	5.4B	5.1D
5	D	3	Readiness	5.4H	5.1B
6	J	3	Supporting	5.7A	5.1A
7	A	4	Supporting	5.9A	5.1D
8	H	4	Supporting	5.10F	5.1A
9	B	3	Supporting	5.7A	5.1B
10	280 cm	3	Supporting	5.7A	5.1B