

# STAAR CONNECTION™

## Diagnostic Series™

Math  
**6**  
teacher  
v2



**KAMICO®**  
Instructional Media, Inc.

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Math  
**6**  
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 6 Math**  
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## Reporting Categories and Related TEKS Grade 6 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.**

- (6.1) **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.

- (6.2) **Number and operations.** The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to
- (A) classify whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers; **Supporting Standard**
  - (B) identify a number, its opposite, and its absolute value; **Supporting Standard**
  - (C) locate, compare, and order integers and rational numbers using a number line; **Supporting Standard**
  - (D) order a set of rational numbers arising from mathematical and real-world contexts; and **Readiness Standard**
  - (E) extend representations for division to include fraction notation such as  $a/b$  represents the same number as  $a \div b$  where  $b \neq 0$ . **Supporting Standard**
- (6.4) **Proportionality.** The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to
- (C) give examples of ratios as multiplicative comparisons of two quantities describing the same attribute; **Supporting Standard**
  - (D) give examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients; **Supporting Standard**
  - (E) represent ratios and percents with concrete models, fractions, and decimals; **Supporting Standard**
  - (F) represent benchmark fractions and percents such as 1%, 10%, 25%, 33  $\frac{1}{3}$ %, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers; and **Supporting Standard**
  - (G) generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money. **Readiness Standard**

- (6.5) **Proportionality.** The student applies mathematical process standards to solve problems involving proportional relationships. The student is expected to
- (C) use equivalent fractions, decimals, and percents to show equal parts of the same whole. **Supporting Standard**
- (6.7) **Expressions, equations, and relationships.** The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to
- (A) generate equivalent numerical expressions using order of operations, including whole number exponents, and prime factorization;  
**Readiness Standard**
  - (B) distinguish between expressions and equations verbally, numerically, and algebraically; **Supporting Standard**
  - (C) determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations; and  
**Supporting Standard**
  - (D) generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties.  
**Readiness Standard**

## Reporting Category 2: Computations and Algebraic Relationships

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

- (6.3) **Number and operations.** The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to
- (A) recognize that dividing by a rational number and multiplying by its reciprocal result in equivalent values; **Supporting Standard**
  - (B) determine, with and without computation, whether a quantity is increased or decreased when multiplied by a fraction, including values greater than or less than one; **Supporting Standard**
  - (C) represent integer operations with concrete models and connect the actions with the models to standardized algorithms; **Supporting Standard**
  - (D) add, subtract, multiply, and divide integers fluently; and **Readiness Standard**
  - (E) multiply and divide positive rational numbers fluently. **Readiness Standard**
- (6.4) **Proportionality.** The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to
- (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; and **Supporting Standard**
  - (B) apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates. **Readiness Standard**
- (6.5) **Proportionality.** The student applies mathematical process standards to solve problems involving proportional relationships. The student is expected to
- (A) represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions; and **Supporting Standard**



- (B) solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models. **Readiness Standard**
- (6.6) **Expressions, equations, and relationships.** The student applies mathematical process standards to use multiple representations to describe algebraic relationships. The student is expected to
- (A) identify independent and dependent quantities from tables and graphs; **Supporting Standard**
- (B) write an equation that represents the relationship between independent and dependent quantities from a table; and **Supporting Standard**
- (C) represent a given situation using verbal descriptions, tables, graphs, and equations in the form  $y = kx$  or  $y = x + b$ . **Readiness Standard**
- (6.9) **Expressions, equations, and relationships.** The student applies mathematical process standards to use equations and inequalities to represent situations. The student is expected to
- (A) write one-variable, one-step equations and inequalities to represent constraints or conditions within problems; **Supporting Standard**
- (B) represent solutions for one-variable, one-step equations and inequalities on number lines; and **Supporting Standard**
- (C) write corresponding real-world problems given one-variable, one-step equations or inequalities. **Supporting Standard**
- (6.10) **Expressions, equations, and relationships.** The student applies mathematical process standards to use equations and inequalities to solve problems. The student is expected to
- (A) model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts; and **Readiness Standard**
- (B) determine if the given value(s) make(s) one-variable, one-step equations or inequalities true. **Supporting Standard**

### **Reporting Category 3: Geometry and Measurement**

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

- (6.4) **Proportionality.** The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to
- (H) convert units within a measurement system, including the use of proportions and unit rates. **Readiness Standard**
- (6.8) **Expressions, equations, and relationships.** The student applies mathematical process standards to use geometry to represent relationships and solve problems. The student is expected to
- (A) extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle; **Supporting Standard**
  - (B) model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes; **Supporting Standard**
  - (C) write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers; and **Supporting Standard**
  - (D) determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers. **Readiness Standard**
- (6.11) **Measurement and data.** The student applies mathematical process standards to use coordinate geometry to identify locations on a plane. The student is expected to
- (A) graph points in all four quadrants using ordered pairs of rational numbers. **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.**

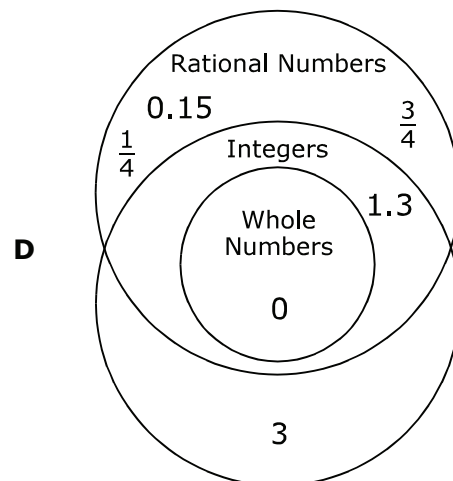
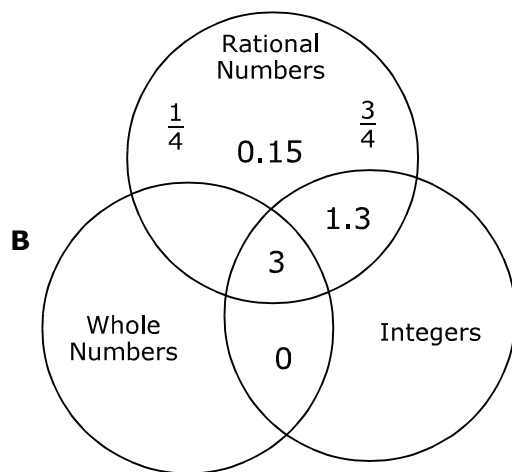
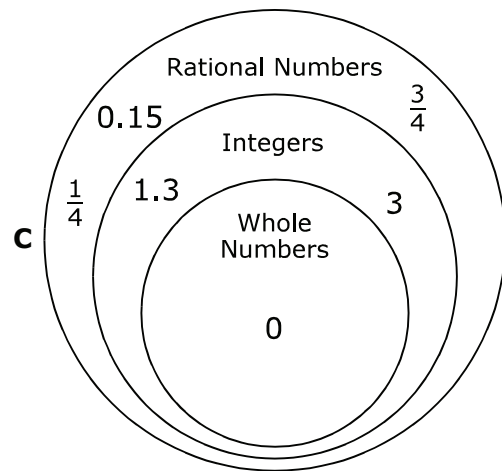
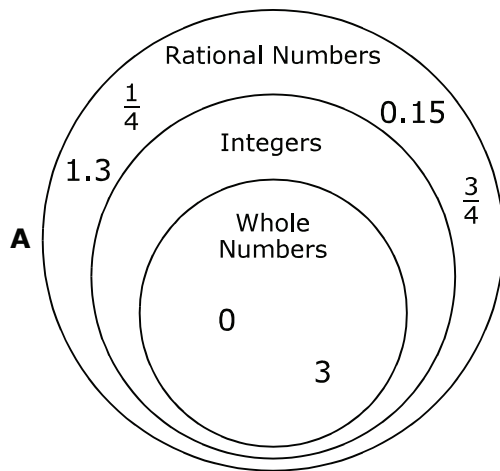
- (6.12) **Measurement and data.** The student applies mathematical process standards to use numerical or graphical representations to analyze problems. The student is expected to
- (A) represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots; **Supporting Standard**
  - (B) use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution; **Supporting Standard**
  - (C) summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution; and **Readiness Standard**
  - (D) summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution. **Readiness Standard**
- (6.13) **Measurement and data.** The student applies mathematical process standards to use numerical or graphical representations to solve problems. The student is expected to
- (A) interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots; and **Readiness Standard**
  - (B) distinguish between situations that yield data with and without variability. **Supporting Standard**
- (6.14) **Personal financial literacy.** The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to
- (A) compare the features and costs of a checking account and a debit card offered by different local financial institutions; **Supporting Standard**

- (B) distinguish between debit cards and credit cards;  
***Supporting Standard***
- (C) balance a check register that includes deposits, withdrawals, and transfers; ***Supporting Standard***
- (E) describe the information in a credit report and how long it is retained;  
***Supporting Standard***
- (F) describe the value of credit reports to borrowers and to lenders;  
***Supporting Standard***
- (G) explain various methods to pay for college, including through savings, grants, scholarships, student loans, and work-study; and  
***Supporting Standard***
- (H) compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income.  
***Supporting Standard***

Name \_\_\_\_\_ Date \_\_\_\_\_

- 1** For one week during the summer, Angelica recorded the amount of measurable rain that fell each day. On Sunday, there was a major thunderstorm, and 3 inches of rain fell in her yard. On Monday, the last of the storm dropped another 1.3 inches. Tuesday and Wednesday saw brief afternoon rains of  $\frac{1}{4}$  inch and 0.15 inch, respectively. No rain fell on Thursday and Friday. The rain shower on Saturday brought  $\frac{3}{4}$  inch.

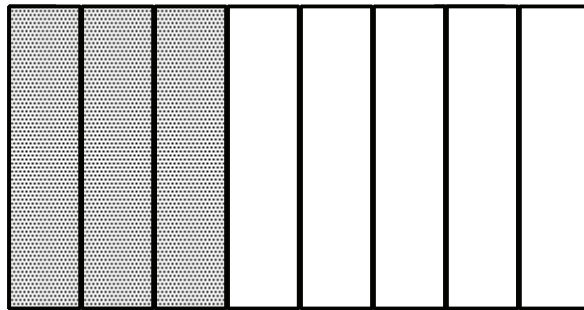
Which Venn diagram is the correct representation of the relationship among the numbers of inches of rain measured by Angelica?



- 2** Alison is a professional photographer, and she purchases memory cards from Phil's Photo Shop. Normally, Phil sells a 4-gigabyte memory card for \$10, but because Alison buys so many 4-GB memory cards, she receives a reduced price. Alison can purchase 12 4-GB memory cards for \$96. If she pays the same rate per card for any number of 4-GB memory cards she buys, how much would it cost her to buy 40 memory cards?

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

- 3** Alec has a rectangular plot of land to use for a vegetable garden. He divides the plot into eight sections. Alec decides to plant squash in 3 of the eight sections.



Since Alec only plans on planting yellow squash and zucchini squash, he decides to divide the  $\frac{3}{8}$  of the garden into 2 equal parts,  $\frac{3}{8} \div 2$ . What fractional part of the plot of land represents the amount of the garden used for yellow squash?

- A**  $\frac{3}{11}$
- B**  $\frac{6}{16}$
- C**  $\frac{3}{16}$
- D**  $\frac{3}{4}$

- 4 James's family decided to build a border around their garden to keep out the grass. A truck delivered a pallet of bricks, and James was given the task of loading bricks into a wheelbarrow to be moved to the backyard. If James puts too few bricks in the wheelbarrow, he will have to make extra trips to the backyard. If he puts too many bricks in the wheelbarrow, it will be too heavy to move. James collected the following data concerning the weight of the bricks.

Number of Bricks ( $x$ )	1	2	3	4
Total Weight of Bricks (lb) ( $y$ )	4	8	12	16

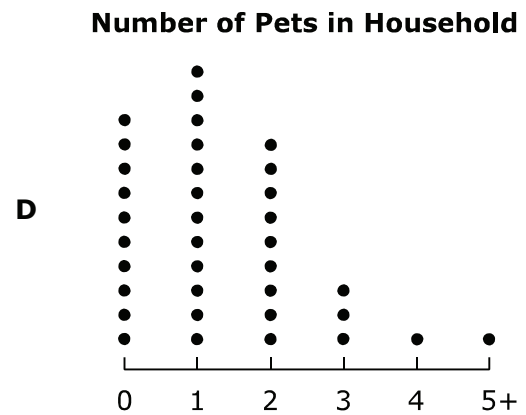
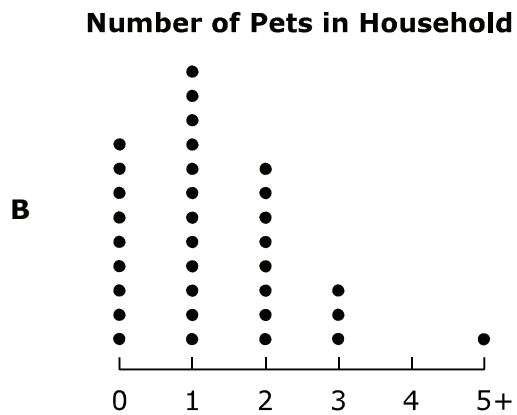
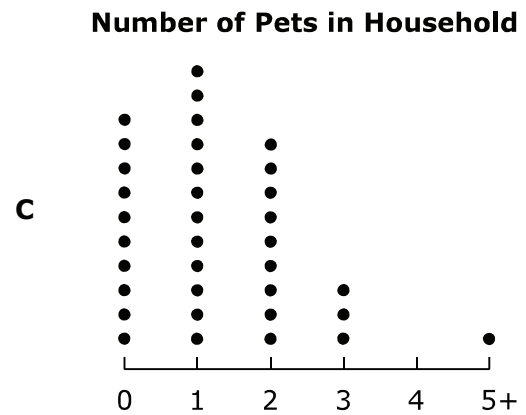
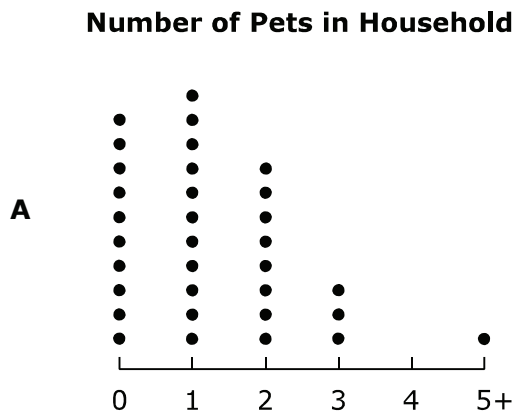
Which equation should James use to find the total weight of  $x$  number of bricks?

- F**  $y = x + 4$
- G**  $y = 4x$
- H**  $y = x + 3$
- J**  $y = \frac{1}{4}x$
- 5 Speed limit signs in the United States are in miles per hour. Speed limit signs in Canada are in kilometers per hour. An American tourist is driving at the speed limit of 80 kph on a Canadian highway. About how many miles per hour is this tourist driving, given that 1 kilometer is approximately equal to 0.62 mile?
- A** 55 mph
- B** 129 mph
- C** 50 mph
- D** 100 mph
- 6 Jenny needs to do an interior design project for her pottery class. She has decided to make a cluster of triangular vases of varying sizes in different shades of blue. Which set of measures **cannot** be used to create the sides of the base of a triangular vase?
- F** 5 in., 7 in., 11 in.
- G** 15 cm, 12 cm, 6 cm
- H** 9 cm, 9 cm, 12 cm
- J** 2 in., 3 in., 6 in.

- 7 For a class project, Tavi asked his classmates how many pets were in their household. He recorded their answers in a frequency table, one mark per student. The data for the first 35 students interviewed is shown.

Number of Pets in Household	
0	
1	
2	
3	
4	
5+	

Which plot is a correct representation of the data that Tavi collected?





- 8** Drew has been granted a college scholarship that will pay for his tuition and books. Drew's parents will pay for his dorm room, but Drew will be responsible for earning his spending money and for buying his food. Drew started a new job earning \$9.00 per hour. He will work 10 hours each weekend during the school year and 40 hours each week during the summer. Drew is opening a checking account with \$150 he received for his 17th birthday. Drew will have his paychecks deposited directly into this account. Which is the best bank for Drew to maintain a checking account during his college years?
- F** Bank A requires \$50 to open a checking account. The \$8.95 per month maintenance fee can be waived with a \$300 minimum daily balance or with \$400 per month in direct deposits.
- G** Bank B requires \$50 to open a checking account. A \$5.00 per month maintenance fee is charged to account holders who are 17 to 24 years old. The maintenance fee can be waived with \$500 per month in direct deposits or with a \$1500 minimum daily balance.
- H** Bank C requires \$25 to open a checking account. The \$12 per month maintenance fee can be waived with \$250 per month in direct deposits or with a \$1500 minimum daily balance. Students under 23 years of age are eligible for a waiver of the monthly fee while enrolled in high school, college, or a vocational program.
- J** Bank D requires \$25 to open a checking account. There is a bonus of \$150 for opening a new checking account now; however, if the account is closed within 6 months, the bonus will be deducted at closing. The \$12 per month maintenance fee can be waived with \$500 per month in direct deposits or with a \$1500 minimum daily balance.

- 9** Kathryn got a new GPS watch that measures her walking distance. It is more accurate than the pedometer she already had, especially outdoors. The pedometer measures steps and calculates distance based on the number of steps, while the GPS watch calculates distance based on its position relative to satellites. For an experiment, Kathryn uses both devices for two weeks. She walks for exercise three times a week and removes both her GPS watch and pedometer at other times. The first week, the watch shows that she walks 3.52 miles on Monday, 3.43 miles on Wednesday, and 2.82 miles on Friday. The pedometer shows that she walks 3.59 miles on Monday, 3.48 miles on Wednesday, and 2.87 miles on Friday. The second week, the watch shows she walks 3.83 miles on Monday, 2.78 miles on Wednesday, and 4.24 miles on Friday. The pedometer records 3.85 miles on Monday, 2.92 miles on Wednesday, and 4.27 miles on Friday. What distance, in yards, does the pedometer differ from the GPS watch during each day of the first week?

**A** Monday 0.07 yard  
Wednesday 0.05 yard  
Friday 0.05 yard

**C** Monday 123.2 yards  
Wednesday 88 yards  
Friday 88 yards

**B** Monday 0.02 yard  
Wednesday 0.14 yard  
Friday 0.03 yard

**D** Monday 35.2 yards  
Wednesday 246.4 yards  
Friday 52.8 yards

- 10** The Texas state bird is the northern mockingbird. These amazing birds sing medleys of dozens of other birds' songs. They can also mimic insects, animals such as dogs and cats, and even machinery. An adult northern mockingbird is from 20.5 to 28 centimeters long, including its tail. Female northern mockingbirds typically have 2 to 6 eggs in a clutch, with eggs ranging in size from 20.1 millimeters long and 16 millimeters wide to 29 millimeters long and 20.3 millimeters wide. If a female northern mockingbird that is 22.3 centimeters long has 3 eggs that are 24.6, 25.5, and 24.9 millimeters long, how many times as long as the average length of her eggs is this female northern mockingbird?

**F** 557.5

**G** 29.73

**H** 8.92

**J** 2.7

Student  
Name:

STAAR CONNECTION™  
Grade 6  
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.

<b>Assessment 1</b>					
<b>Item Number</b>	<b>Correct Answer</b>	<b>Reporting Category</b>	<b>Readiness or Supporting</b>	<b>Content Student Expectation (TEKS)</b>	<b>Process Student Expectation (TEKS)</b>
1	A	1	Supporting	6.2A	6.1D
2	\$320	1	Supporting	6.4C	6.1B
3	C	2	Supporting	6.3A	6.1B
4	G	2	Supporting	6.4A	6.1A
5	C	3	Readiness	6.4H	6.1B
6	J	3	Supporting	6.8A	6.1B
7	C	4	Supporting	6.12A	6.1E
8	H	4	Supporting	6.14A	6.1A
9	C	3	Readiness	6.4H	6.1B
10	H	3	Readiness	6.4H	6.1B