

**2009 – Grade 4 - NYS Math Exam
Item #1**

Strand: Number Sense and Operations

Performance Indicator: 4.N03 Compare and order numbers to 10,000

Points: 1

Four students at a fair bought the game tickets shown below.

| | | | |
|-----------------|-----------------|-----------------|-----------------|
| Number 8,597 | Number 7,896 | Number 8,759 | Number 7,658 |
|-----------------|-----------------|-----------------|-----------------|

Which list shows the numbers on the tickets in order from the **greatest** to the **least**?

- A 8,597 8,759 7,896 7,658
- B 7,658 7,896 8,759 8,597
- C 8,759 8,597 7,896 7,658
- D 7,896 8,759 7,658 8,597



2009 – Grade 4 - NYS Math Exam
Item #2

Strand: Number Sense and Operations

Performance Indicator: 3.N19 Develop fluency with single-digit multiplication facts

Points: 1

$$6 \times 7 =$$

A 35

B 42

C 48

D 49



2009 – Grade 4 - NYS Math Exam Item #3

Strand: Number Sense and Operations

Performance Indicator: 4.N04 Understand the place value structure of the base ten number system:

10 ones = 1 ten

10 tens = 1 hundred

10 hundreds = 1 thousand

10 thousands = 1 ten thousand

Points: 1

What number is equal to 12 thousands + 4 tens + 7 ones?

- A 1,247
- B 2,047
- C 12,047
- D 12,407

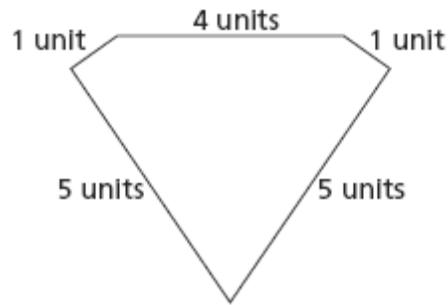
**2009 – Grade 4 - NYS Math Exam
Item #4**

Strand: Geometry

Performance Indicator: 4.G03 Find perimeter of polygons by adding sides

Points: 1

Abigail drew the figure below.



[not drawn to scale]

What is the perimeter, in units, of the figure?

- A 5
- B 6
- C 10
- D 16



2009 – Grade 4 - NYS Math Exam Item #5

Strand: Number Sense and Operations

Performance Indicator: 4.N14 Use a variety of strategies to add and subtract numbers up to 10,000

Points: 1

Jonathan is earning points by selling magazines. He earned 2,325 points in April and 3,746 points in May. What is the total number of points Jonathan earned in April and May?

- A 5,061
- B 5,071
- C 6,061
- D 6,071

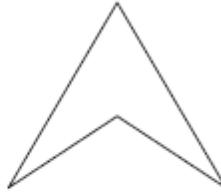
2009 – Grade 4 - NYS Math Exam
Item #6

Strand: Geometry

Performance Indicator: 4.G02 Identify points and line segments when drawing a plane figure

Points: 1

How many line segments does the shape shown below have?



- A 2
- B 3
- C 4
- D 5



2009 – Grade 4 - NYS Math Exam Item #7

Strand: Algebra

Performance Indicator: 4.A03 Find the value or values that will make an open sentence true, if it contains $<$ or $>$

Points: 1

Which number belongs on the line below to make the number sentence correct?

$$4 + \underline{\quad ? \quad} < 2 + 7$$

- A 3
- B 5
- C 7
- D 9



2009 – Grade 4 - NYS Math Exam
Item #8

Strand: Number Sense and Operations

Performance Indicator: 4.N06 Understand, use, and explain the associative property of multiplication

Points: 1

Which expression is equal to $(34 \times 5) \times 2$?

A $2 \times (5 + 34)$

B $(2 \times 5) + 34$

C $34 \times (5 \times 2)$

D $34 + (5 \times 2)$



2009 – Grade 4 - NYS Math Exam

Item #9

Strand: Number Sense and Operations

Performance Indicator: 4.N18 Use a variety of strategies to multiply two-digit numbers by one-digit numbers (with and without regrouping)

Points: 1

At a school concert, the student singers stand in 4 rows. There are 16 students in each row. What is the total number of students in the 4 rows?

- A 20
- B 44
- C 54
- D 64



2009 – Grade 4 - NYS Math Exam
Item #10

Strand: Number Sense and Operations

Performance Indicator: 4.N21 Use a variety of strategies to divide two-digit dividends by one-digit divisors (with and without remainders)

Points: 1

Mr. Rosner buys 48 golf balls. The golf balls are in packages of 6.
How many packages does Mr. Rosner buy?

- A 6
- B 7
- C 8
- D 9

**2009 – Grade 4 - NYS Math Exam
Item #11**

Strand: Measurement

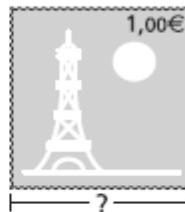
Performance Indicator: 4.M02 Use a ruler to measure to the nearest standard unit (whole, $\frac{1}{2}$ and $\frac{1}{4}$ inches, whole feet, whole yards, whole centimeters, and whole meters)

Points: 1



Use your ruler to help you solve this problem.

The stamp shown below is from Ana's stamp collection.



What is the width, in inches, of the bottom of the stamp?

- A 1
- B $1\frac{1}{4}$
- C $1\frac{1}{2}$
- D $1\frac{3}{4}$



2009 – Grade 4 - NYS Math Exam
Item #12

Strand: Number Sense and Operations

Performance Indicator: 4.N02 Read and write whole numbers to 10,000

Points: 1

Rachel writes a number on the board. The number has the digit 4 in the hundreds place and the digit 2 in the ones place. Which number could Rachel have written?

- A 4,267
- B 4,672
- C 7,426
- D 7,462



2009 – Grade 4 - NYS Math Exam Item #13

Strand: Number Sense and Operations

Performance Indicator: 4.N20 Develop fluency in multiplying and dividing multiples of 10 and 100 up to 1,000

Points: 1

Jacob takes 15 boxes of books to the school library. Each box contains 10 books.
What is the total number of books Jacob takes to the library?

- A 25
- B 150
- C 1,500
- D 1,510



2009 – Grade 4 - NYS Math Exam
Item #14

Strand: Number Sense and Operations

Performance Indicator: 3.N25 Estimate numbers up to 500

Points: 1

Jon, Vincent, and Alana each have a stamp collection. Jon has 197 stamps, Vincent has 32 stamps, and Alana has 98 stamps. What is the **best estimation** of the total number of stamps the three people have collected?

- A 310
- B 320
- C 330
- D 400

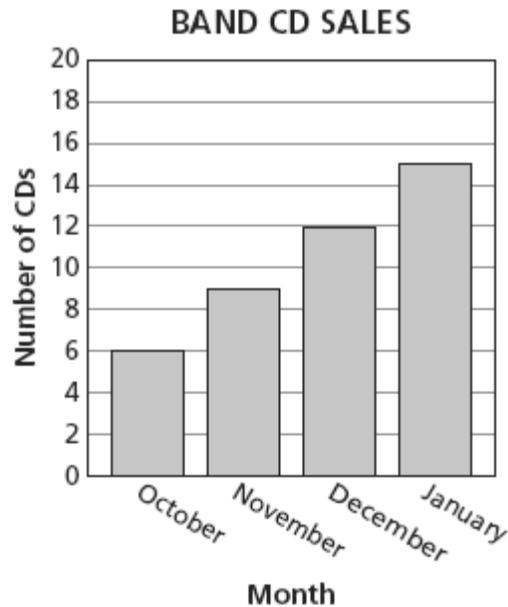
**2009 – Grade 4 - NYS Math Exam
Item #15**

Strand: Statistics and Probability

Performance Indicator: 4.S06 Formulate conclusions and make predictions from graphs

Points: 1

Lee's new band is selling CDs. The number of CDs sold during four months is shown in the bar graph below.



The number of CDs sold each month increased at the same rate through February. How many CDs did the band sell in February?

- A 16
- B 17
- C 18
- D 19

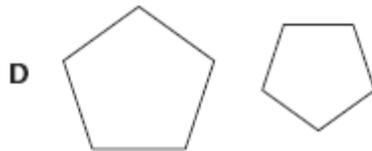
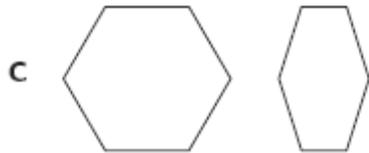
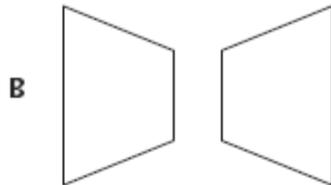
**2009 – Grade 4 - NYS Math Exam
Item #16**

Strand: Geometry

Performance Indicator: 3.G02 Identify congruent and similar figures

Points: 1

One pair of shapes shown below is congruent. Which pair of shapes is congruent?





2009 – Grade 4 - NYS Math Exam
Item #17

Strand: Number Sense and Operations

Performance Indicator: 4.N17 Use multiplication and division as inverse operations to solve problems

Points: 1

Sydney writes the number sentence below.

$$24 \div 4 = 6$$

Which number sentence could Sydney use to check her work?

A $6 \div 4 = \underline{\quad ? \quad}$

B $4 \times 6 = \underline{\quad ? \quad}$

C $6 \times 24 = \underline{\quad ? \quad}$

D $24 \times 4 = \underline{\quad ? \quad}$

**2009 – Grade 4 - NYS Math Exam
Item #18**

Strand: Measurement

Performance Indicator: 4.M10 Calculate elapsed time in days and weeks, using a calendar

Points: 1

18 The science fair at Mike’s school is on April 12.

APRIL

| SUN | MON | TUE | WED | THU | FRI | SAT |
|-----|-----|-----|-----|-----|-----|-----------------------|
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 Science Fair |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | | | |

The spring festival at his school is 2 weeks and 3 days after the science fair.
On what date is the spring festival?

- A** April 15
- B** April 18
- C** April 26
- D** April 29

**2009 – Grade 4 - NYS Math Exam
Item #19**

Strand: Algebra

Performance Indicator: 4.A05 Analyze a pattern or a whole-number function and state the rule, given a table or an input/output box

Points: 1

Joey makes the Input-Output table shown below.

JOEY'S INPUT-OUTPUT TABLE

| Input | Output |
|-------|--------|
| 3 | 18 |
| 5 | 20 |
| 15 | 30 |
| 20 | 35 |

What rule could be used to find each Output number?

- A** Add 2 to the Input number.
- B** Add 15 to the Input number.
- C** Multiply the Input number by 4.
- D** Multiply the Input number by 6.



2009 – Grade 4 - NYS Math Exam
Item #20

Strand: Number Sense and Operations

Performance Indicator: 3.N14 Explore equivalent fractions ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$)

Points: 1

Which fraction is equivalent to $\frac{2}{6}$?

A $\frac{1}{2}$

B $\frac{1}{3}$

C $\frac{1}{4}$

D $\frac{1}{5}$



2009 – Grade 4 - NYS Math Exam Item #21

Strand: Algebra

Performance Indicator: 4.A02 Use the symbols $<$, $>$, $=$, and \neq (with and without the use of a number line) to compare whole numbers and unit fractions and decimals (up to hundredths)

Points: 1

The two statements below describe the number of apples, bananas, and oranges in a bowl.

- the number of apples $>$ the number of oranges
- the number of bananas $=$ the number of oranges

Which could be the number of apples, bananas, and oranges in the bowl?

- A** 4 apples, 2 bananas, 2 oranges
- B** 4 apples, 4 bananas, 2 oranges
- C** 2 apples, 4 bananas, 4 oranges
- D** 4 apples, 2 bananas, 4 oranges

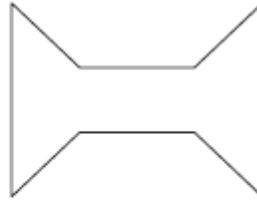
2009 – Grade 4 - NYS Math Exam
Item #22

Strand: Geometry

Performance Indicator: 4.G01 Identify and name polygons, recognizing that their names are related to the number of sides and angles (triangle, quadrilateral, pentagon, hexagon, and octagon)

Points: 1

What is the name of the shape below?



- A octagon
- B hexagon
- C pentagon
- D quadrilateral

**2009 – Grade 4 - NYS Math Exam
Item #23**

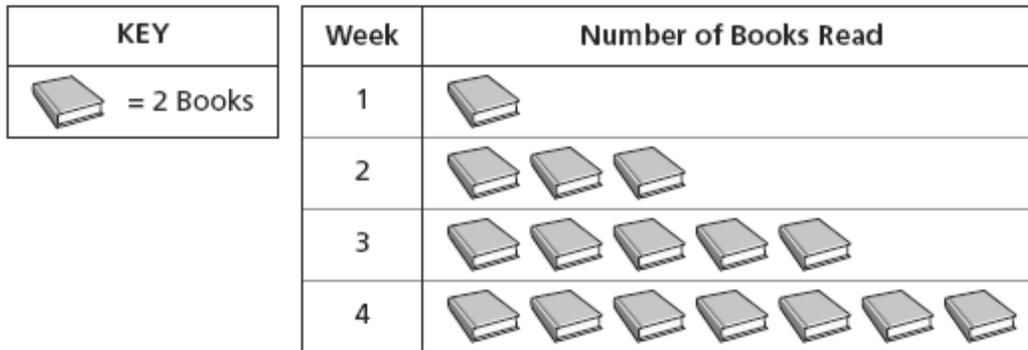
Strand: Statistics and Probability

Performance Indicator: 4.S06 Formulate conclusions and make predictions from graphs

Points: 1

- 23** The pictograph below shows the total number of library books Ms. Campbell's class read during a four-week period.

LIBRARY BOOKS



If the pattern in the pictograph continues for two more weeks, how many books will have been read by the end of Week 6?

- A 11
- B 16
- C 18
- D 22



2009 – Grade 4 - NYS Math Exam
Item #24

Strand: Algebra

Performance Indicator: 4.A04 Describe, extend, and make generalizations about numeric (+, -, ×, ÷) and geometric patterns

Points: 1

Steve writes the number pattern below.

13 , 19 , 25 , ? , 37 , 43

What is the missing number in Steve's pattern?

- A 27
- B 29
- C 31
- D 33



2009 – Grade 4 - NYS Math Exam Item #25

Strand: Number Sense and Operations

Performance Indicator: 4.N27 Check reasonableness of an answer by using estimation

Points: 1

Ms. Snyder wants to buy 5 pencils for each of her 28 students. She estimates she must buy 150 pencils. Which statement best explains whether Ms. Snyder's estimate is reasonable?

- A It is reasonable because $5 \times 30 = 150$.
- B It is reasonable because $5 \times 25 = 125$.
- C It is not reasonable because $5 \times 28 = 140$.
- D It is not reasonable because $5 \times 20 = 100$.



2009 – Grade 4 - NYS Math Exam
Item #26

Strand: Number Sense and Operations

Performance Indicator: 4.N26 Round numbers less than 1,000 to the nearest tens and hundreds

Points: 1

At the beginning of the day, there were 813 hot dogs at the county fair. During the day, 597 hot dogs were sold. What expression can be used to estimate the number of hot dogs left at the end of the day?

- A $800 - 500$
- B $800 - 600$
- C $900 - 500$
- D $900 - 600$



2009 – Grade 4 - NYS Math Exam
Item #27

Strand: Number Sense and Operations

Performance Indicator: 4.N15 Select appropriate computational and operational methods to solve problems

Points: 1

Every month Mr. Jenkins buys 2 magazines. Each magazine costs 3 dollars.
Which expression could be used to find the total cost of the 2 magazines for 12 months?

- A 2×12
- B 3×12
- C $2 + 3 \times 12$
- D $2 \times 3 \times 12$



2009 – Grade 4 - NYS Math Exam
Item #28

Strand: Measurement

Performance Indicator: 4.M09 Calculate elapsed time in hours and half hours, not crossing A.M./P.M.

Points: 1

Mr. Starr began working in his garden at 8:00 A.M. He finished working at 11:30 A.M. How long did Mr. Starr work in his garden?

- A 2 hours 30 minutes
- B 3 hours
- C 3 hours 30 minutes
- D 4 hours



2009 – Grade 4 - NYS Math Exam
Item #29

Strand: Number Sense and Operations

Performance Indicator: 4.N22 Interpret the meaning of remainders

Points: 1

There were 34 people riding in 5 cars on a roller coaster ride. If there were 8 people riding in each of the first 4 cars, how many people were riding in the last car?

- A 1
- B 2
- C 3
- D 4



2009 – Grade 4 - NYS Math Exam
Item #30

Strand: Measurement

Performance Indicator: 4.M06 Select tools and units appropriate to the capacity being measured (milliliters and liters)

Points: 1

Which unit of measure is **best** for measuring the amount of water in a bathtub?

- A liter
- B gram
- C meter
- D milliliter

**2009 – Grade 4 - NYS Math Exam
Item #31**

Strand: Number Sense and Operations

Performance Indicator: 4.N22 Interpret the meaning of remainders

Points: 2

Tony cuts a tree into 45 logs. He places the logs in stacks of 6 logs, as shown below.



Tony makes as many complete stacks as possible. How many logs does he have left?

Show your work.

Answer _____ logs

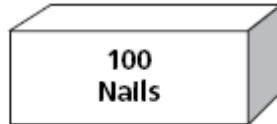
2009 – Grade 4 - NYS Math Exam
Item #32

Strand: Number Sense and Operations

Performance Indicator: 4.N20 Develop fluency in multiplying and dividing multiples of 10 and 100 up to 1,000

Points: 2

Mr. Morris needs to buy 700 nails to build a deck. The store sells the nails in boxes of 100 nails, as shown below.



How many **boxes** of nails does Mr. Morris need to buy?

Answer _____ boxes

On Monday, Mr. Morris used exactly 3 of the boxes of nails. How many **nails** did Mr. Morris use on Monday?

Answer _____ nails



2009 – Grade 4 - NYS Math Exam
Item #33

Strand: Number Sense and Operations

Performance Indicator: 4.N16 Understand various meanings of multiplication and division

Points: 2

There are 72 students sitting at 6 tables in a cafeteria. If the same number of students are seated at each table, how many students are at each table?

Show your work.

Answer _____ students



2009 – Grade 4 - NYS Math Exam Item #34

Strand: Algebra

Performance Indicator: 4.A01 Evaluate and express relationships using open sentences with one operation

Points: 2

Last year, Joshua practiced karate for 112 hours. Brianna practiced karate for 12 hours fewer than Joshua.

On the line below, complete the number sentence that could be used to find the number of hours Brianna practiced karate.

Number Sentence _____ =

What number does the in your number sentence represent?

Answer = _____



2009 – Grade 4 - NYS Math Exam
Item #35

Strand: Number Sense and Operations

Performance Indicator: 4.N14 Use a variety of strategies to add and subtract numbers up to 10,000

Points: 2

Dan, Jared, and Kiana played video games and recorded the number of points they earned. Dan earned 795 points and Jared earned 1,253 points. The total number of points earned by the three people was 2,830. How many points did Kiana earn?

Show your work.

Answer _____ points

2009 – Grade 4 - NYS Math Exam
Item #36

Strand: Geometry

Performance Indicator: 4.G01 Identify and name polygons, recognizing that their names are related to the number of sides and angles (triangle, quadrilateral, pentagon, hexagon, and octagon)

Points: 2

36 Linda drew the shapes shown below.



Part A

Draw a large X on the shapes above that are quadrilaterals.

Part B

Next, Linda drew a pentagon. How many sides does a pentagon have?

Answer _____ sides



2009 – Grade 4 - NYS Math Exam
Item #37

Strand: Measurement

Performance Indicator: 4.M08 Make change, using combined coins and dollar amounts

Points: 2

Brett spends \$3.89 on cheese and \$2.96 on apples at the grocery store. He gives the cashier \$20.00. How much money does Brett receive in change?

Show your work.

Answer \$ _____



2009 – Grade 4 - NYS Math Exam Item #38

Strand: Statistics and Probability

Performance Indicator: 4.S05 Develop and make predictions that are based on data

Points: 3

The students on Kimani’s track team are training for a race. The table below shows the total number of miles they ran during certain weeks.

TRACK TEAM MILES

| Week | Total number of miles the team ran |
|------|------------------------------------|
| 2 | 24 |
| 4 | 36 |
| 6 | 48 |
| 8 | 60 |
| 10 | ? |

If the pattern in the table continues for two more weeks, how many miles will the team run during Week 10?

Answer _____ miles

During what week did the team run exactly 54 miles?

Answer Week _____

On the lines below, explain how you found your answer.

2009 – Grade 4 - NYS Math Exam Item #39

Strand: Algebra

Performance Indicator: 4.A05 Analyze a pattern or a whole-number function and state the rule, given a table or an input/output box

Points: 3

Ms. Marshall started making dolls. The table below shows the total number of dolls she had made by the end of each of the first four weeks.

MS. MARSHALL'S DOLLS

| Week | Total Number of Dolls |
|------|-----------------------|
| 1 | 3 |
| 2 | 6 |
| 3 | 9 |
| 4 | 12 |

If the pattern in the table continues, how many dolls will Ms. Marshall have made by the end of Week 6?

Answer _____ dolls

On the line below, write the rule that can be used to find the total number of dolls Ms. Marshall made by the end of any number of weeks.

Rule _____

Ms. Marshall wants to make a total of 30 dolls. If the pattern in the table continues, by the end of which week will she have made 30 dolls?

Answer Week _____



2009 – Grade 4 - NYS Math Exam
Item #40

Strand: Number Sense and Operations

Performance Indicator: 4.N14 Use a variety of strategies to add and subtract numbers up to 10,000

Points: 2

Last year, 4,390 people stayed at the Sea View Hotel and 2,054 people stayed at the Hilltop Hotel. How many more people stayed at the Sea View Hotel than at the Hilltop Hotel?

Show your work.

Answer _____ people

2009 – Grade 4 - NYS Math Exam
Item #41

Strand: Measurement

Performance Indicator: 4.M08 Make change, using combined coins and dollar amounts

Points: 2

Earl buys a pen at the store. He gives the clerk a \$5 bill and receives the coins shown below as change.



Penny

Penny

Penny

Dime

Nickel

Nickel

How much did the pen cost?

Show your work.

Answer \$ _____



2009 – Grade 4 - NYS Math Exam
Item #42

Strand: Number Sense and Operations

Performance Indicator: 4.N18 Use a variety of strategies to multiply two-digit numbers by one-digit numbers (with and without regrouping)

Points: 2

A locker room next to a gym has 8 rows of lockers with 26 lockers in each row.
What is the total number of lockers?

Show your work.

Answer _____ lockers



2009 – Grade 4 - NYS Math Exam Item #43

Strand: Algebra

Performance Indicator: 4.A02 Use the symbols $<$, $>$, $=$, and \neq (with and without the use of a number line) to compare whole numbers and unit fractions and decimals (up to hundredths)

Points: 2

On Saturday, Cory and Emma washed a total of 5 cars. Cory washed 3 cars and Emma washed 2 cars. Complete the number sentence below by writing the symbol $<$, $>$, or $=$ on the line.

Number Sentence 5 _____ 3 + 2

Last week, Cory washed 17 cars, and Emma washed 21 cars. On the line below, write a number sentence to show the relationship between the number of cars Cory washed and the number of cars Emma washed last week. Use either $<$ or $>$ in your number sentence.

Number Sentence _____



2009 – Grade 4 - NYS Math Exam
Item #44

Strand: Measurement

Performance Indicator: 4.M03 Know and understand equivalent standard units of length: 12 inches = 1 foot

3 feet = 1 yard

Points: 2

Ms. Caldwell planted an apple tree that is 6 feet 4 inches tall. How tall is the tree in inches?

Show your work.

Answer _____ inches



2009 – Grade 4 - NYS Math Exam Item #45

Strand: Number Sense and Operations

Performance Indicator: 4.N17 Use multiplication and division as inverse operations to solve problems

Points: 2

Dennis places 52 shells in 4 equal piles. He writes the number sentence below to find the number of shells in each pile.

$$52 \div 4 = ?$$

How many shells does Dennis place in each pile?

Answer _____ shells

Complete the number sentence that could be used to check to see whether your answer is correct.

Number Sentence $4 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

**2009 – Grade 4 - NYS Math Exam
Item #46**

Strand: Statistics and Probability

Performance Indicator: 4.S03 Represent data using tables, bar graphs, and pictographs

Points: 2

- 46** The pictograph shows the number of cars three students washed during a car wash fundraiser.

STUDENT CAR WASH

| KEY | Student | Number of Cars Washed |
|--|---------|--|
|  = 4 cars | Christy |  |
| | David |  |
| | Mica |  |

Complete the **table** below to show the number of cars each student washed during the car wash.

Be sure to

- title the table
- label and complete the first column
- enter all the data

| | Number of Cars Washed |
|-------|-----------------------|
| | |
| David | |
| | |

**2009 – Grade 4 - NYS Math Exam
Item #47**

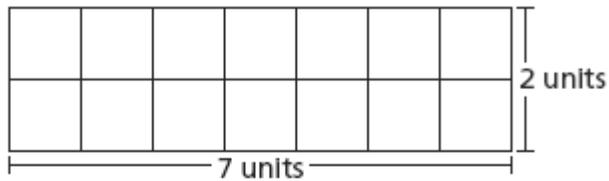
Strand: Geometry

Performance Indicator: 4.G03 Find perimeter of polygons by adding sides

4.G04 Find the area of a rectangle by counting the number of squares needed to cover the rectangle

Points: 3

Jenny makes the bookmark shown below.



What is the **perimeter**, in units, of the bookmark?

Show your work.

Answer _____ units

What is the **area**, in square units, of the bookmark?

Answer _____ square units



2009 – Grade 4 - NYS Math Exam Item #48

Strand: Number Sense and Operations

Performance Indicator: 3.N20 Use a variety of strategies to solve multiplication problems with factors up to 12×12

Points: 3

Mr. Blake ordered 12 boxes of paintbrushes. There were 8 paintbrushes in each box. How many paintbrushes did Mr. Blake order in all?

Show your work.

Answer _____ paintbrushes

Mr. Blake opened some of the boxes of paintbrushes when they arrived. There was a total of 24 paintbrushes in the boxes he opened. How many boxes did Mr. Blake open?

Answer _____ boxes



**NYCDOE Department of Mathematics & Science
Linda Curtis-Bey, Director**