



**ALPHA PLUS**

**TEACHER'S GUIDE**

# **Math 5**



**SAMPLE FOR REVIEW**

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**SUCCESS** **OAS**  
*with*

**Oklahoma Academic Standards**



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**Math 5**

**Ensuring Student Success**  
*with*

**Oklahoma Academic Standards**

*Written by Oklahoma Teachers for Oklahoma Teachers*

*Shannon Stewart*



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# SUCCESS *with* OAS

## ***Math 5 by Shannon Stewart***

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## FOREWORD

Adopted in 2016 by the State Board of Education, the Oklahoma Academic Standards (OAS) mathematics objectives are measurably more rigorous in content and different in terms of vertical alignment than previous curriculum frameworks.

Immediately, Alpha Plus Educational Systems sought highly qualified teachers to develop a teaching and learning resource specifically aligned to the new standards. CEO Jan Barrick also enlisted my help and that of Dr. Frank Wang, President of the Oklahoma School of Science and Mathematics (OSSM), who is a nationally known, accomplished mathematics educator and an experienced textbook publisher. It has been my pleasure to help ensure the content is of high quality and will provide a solid mathematical foundation.

Written by Oklahoma teachers for Oklahoma teachers, the *Success with OAS: Alpha Plus Mathematics* series provides a robust set of resources relating mathematical skills to the real world of Oklahoma students.

-- Edna McDuffie Manning, *EdD.*, *Mathematics*  
Founder and President Emerita, Oklahoma School of Science and Mathematics

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## INTRODUCTION

The *Success with OAS: Alpha Plus Mathematics* framework for instruction, independent student work, and continuous review will prepare students for comprehensive assessments at each grade level. Following is a summary addressing the most effective way to use each element.

### Teacher's Guide

**Objective Statement:** At the beginning of each lesson, the OAS objective is stated as adopted. This is helpful when writing lesson plans and understanding the focus of the lesson.

**Real-World Connections:** Students must be engaged and must relate the concept to their daily lives. Connecting to a real-world application taps into students' prior knowledge and shows the practicality behind the concept. It is suggested that the teacher start with a relevant, age-appropriate game, class discussion, website or video, role-play, or other group activity. This will illustrate the need to learn the skill so that students can use it in their daily lives.

**Vocabulary:** A list of vocabulary words critical to each OAS Objective is provided, particularly those used in the state's *Test and Item Specifications*. A complete vocabulary definition can be found in the student workbook and in the comprehensive Glossary at the end of the book.

**Modeling:** The Modeling section provides step-by-step instructions for one or more ways to teach the objective and the skills related to the lesson. Teachers may use this to direct students and add more examples or details as needed for the teachers' lesson plans.

Extension Activities: This is a list of possible resources to enhance the objective lesson. Every author provided links to tools they use in class, to online content available at no charge for teacher use, and to other lesson-planning resources.

Answer Key: Every Teacher's Guide includes a complete Answer Key for each assessment item in the student workbook. The Answer Key for the Continuous Review designates what objectives are assessed.

Comprehensive Examination: A Comprehensive Examination was developed to resemble the state assessment and encompasses every objective taught. It can be used as a pre-test and post-test for the school year to better prepare students for state-mandated tests. The Answer Key provides the answers with objective numbers.

### **Student Workbook**

Objective Statement: At the beginning of each student lesson is the objective statement. It clearly defines the focus of the lesson.

Real-World Connections: Written in age-appropriate language, this section reminds students of prior knowledge they have on the topic and how they might use this skill in their daily lives. Relevance is essential to student engagement in the lesson. Teachers can highlight this scenario for the students with a game, role-play, or other group activity.

Vocabulary: Each lesson includes a vocabulary list with definitions for the words the students will encounter on state assessments. Students should also learn to use the Glossary in the back of the book.

Guided Practice: Every objective lesson includes a Guided Practice, which is a set of items available for use in class as part of, or after, instruction. The ten practice problems reflect every skill students will use when they work independently.

Independent Practice: The Independent Practice is a series of twenty questions and activities the student may do independently, either in the classroom or for homework. The Independent Practice can also be used for reinforcement or review as needed.

Continuous Review: At the end of each lesson, there is a Continuous Review with ten questions covering objectives taught previously in the book or aligned to key skills from previous grade level(s). The Answer Key designates the objective each question assesses. The Continuous Review is in sequence after each objective lesson or can be used as a weekly assessment to reinforce past skills.

**OAS Mathematics**
**Table of Contents**
**5<sup>th</sup> grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                                                                                                                                                                 | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 1               | 5.N.1.1          | Estimate solutions to division problems in order to assess the reasonableness of results.                                                                                                                                                                                                                             | 1                         | 1                        |
| 2               | 5.N.1.2          | Divide multi-digit numbers, by one- and two-digit divisors, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms.                                                                                                                                           | 13                        | 11                       |
| 3               | 5.N.1.3          | Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number, or a decimal and consider the context in which a problem is situated to select and interpret the most useful form of the quotient for the solution.                          | 27                        | 21                       |
| 4               | 5.N.1.4          | Solve real-world and mathematical problems requiring addition, subtraction, multiplication, and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results. | 42                        | 31                       |
| 5               | 5.A.1.1          | Use tables and rules of up to two operations to describe patterns of change and make predictions and generalizations about real-world and mathematical problems.                                                                                                                                                      | 57                        | 43                       |



**OAS Mathematics**
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**5<sup>th</sup> grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                                                                            | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 6               | 5.A.1.2          | Use a rule or table to represent ordered pairs of whole numbers and graph these ordered pairs on a coordinate plane, identifying the origin and axis in relation to coordinates.                                                 | 77                        | 55                       |
| 7               | 5.A.2.1          | Generate equivalent numerical expressions and solve problems involving whole numbers by applying the commutative, associative, and distributive properties and order of operations (no exponents).                               | 96                        | 67                       |
| 8               | 5.A.2.2          | Determine whether an equation or inequality involving a variable is true or false for a given value of the variable.                                                                                                             | 113                       | 79                       |
| 9               | 5.A.2.3          | Evaluate expressions involving variables when values for the variables are given.                                                                                                                                                | 130                       | 91                       |
| 10              | 5.N.2.1          | Represent decimal fractions (e.g., $\frac{1}{10}$ , $\frac{1}{100}$ ) using a variety of models (e.g., 10 by 10 grids, rational number wheel, base ten blocks, meter stick) and make connections between fractions and decimals. | 143                       | 101                      |
| 11              | 5.N.2.2          | Represent, read and write decimals using place value to describe decimal numbers including fractional numbers as small as thousandths and whole numbers as large as millions.                                                    | 162                       | 115                      |
| 12              | 5.N.2.3          | Compare and order fractions and decimals, including mixed numbers and fractions less than one, and locate on a number line.                                                                                                      | 177                       | 127                      |



**OAS Mathematics**
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**5<sup>th</sup> grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                                                                                                                                                              | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 13              | 5.N.2.4          | Recognize and generate equivalent decimals, fractions, mixed numbers, and fractions less than one in various contexts.                                                                                                                                                                                             | 195                       | 141                      |
| 14              | 5.N.3.1          | Estimate sums and differences of fractions with like and unlike denominators, mixed numbers, and decimals using a variety of representation (e.g., fraction strips, area models, number lines, fraction rods).                                                                                                     | 213                       | 153                      |
| 15              | 5.N.3.2          | Illustrate addition and subtraction of fractions with like and unlike denominators, mixed numbers, and decimals using a variety of representations (e.g., fraction strips, area models, number lines, fraction rods).                                                                                              | 231                       | 167                      |
| 16              | 5.N.3.3          | Add and subtract fractions with like and unlike denominators, mixed numbers, and decimals. Using efficient and generalizable procedures, including but not limited to standard algorithms in order to solve real-world and mathematical problems including those involving money, measurement, geometry, and data. | 256                       | 183                      |
| 17              | 5.N.3.4          | Find 0.1 more than a number and 0.1 less than a number. Find 0.01 more than a number and 0.01 less than a number. Find 0.001 more than a number and 0.001 less than a number.                                                                                                                                      | 276                       | 197                      |
| 18              | 5.GM.1.1         | Describe a length to the nearest whole unit using a number and a unit.                                                                                                                                                                                                                                             | 288                       | 207                      |

**OAS Mathematics**
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**5<sup>th</sup> grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                                                                                                                                                                                          | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 19              | 5.GM.1.2         | Describe and classify three-dimensional figures including cubes, rectangular prisms, and pyramids by the number of edges, faces, or vertices as well as the shapes of faces.                                                                                                                                                                   | 307                       | 221                      |
| 20              | 5.GM.1.3         | Recognize and draw a net for a three-dimensional figure (e.g., cubes, rectangular prisms, pyramids).                                                                                                                                                                                                                                           | 320                       | 231                      |
| 21              | 5.GM.2.1         | Recognize that the volume of rectangular prisms can be determined by the number of cubes ( $n$ ) and by the product of the dimensions of the prism ( $a \times b \times c = n$ ). Know that the rectangle prisms of different dimensions ( $p$ , $q$ , and $r$ ) can have the same volume if $a \times b \times c = p \times q \times r = n$ . | 343                       | 245                      |
| 22              | 5.GM.2.2         | Recognize that the surface area of a three-dimensional figure with rectangular faces with whole numbered edges can be found by finding the area of each component of the net of that figure. Know that three-dimensional shapes of different dimensions can have the same surface area.                                                        | 363                       | 261                      |
| 23              | 5.GM.2.3         | Find the perimeter of polygons and create arguments for reasonable values for the perimeter of shapes that include curves.                                                                                                                                                                                                                     | 383                       | 279                      |
| 24              | 5.GM.3.1         | Measure and compare angles according to size.                                                                                                                                                                                                                                                                                                  | 402                       | 293                      |

**OAS Mathematics**
**Table of Contents**
**5<sup>th</sup> grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                       | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 25              | 5.GM.3.2         | Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or 1/16-inch.                                                          | 420                       | 309                      |
| 26              | 5.GM.3.3         | Recognize and use the relationship between inches, feet, and yards to measure and compare objects.                                                                          | 443                       | 329                      |
| 27              | 5.GM.3.4         | Recognize and use the relationship between millimeters, centimeters, and meters to measure and compare objects.                                                             | 458                       | 343                      |
| 28              | 5.D.1.1          | Find the measure of central tendency (mean, median, or mode) and range of a set of data. Understand that the mean is a “leveling out” or central balance point of the data. | 476                       | 359                      |
| 29              | 5.D.1.2          | Create and analyze line and double-bar graphs with whole numbers, fractions, and decimals increments.                                                                       | 497                       | 375                      |

## Teacher's Guide

### 5.N.1.1 Estimate solutions to division problems in order to assess the reasonableness of results.

#### Real-World Connections

Students will learn that they will use division in their everyday lives more than they realize. Division is the idea of separating, or dividing, parts of a whole. Sometimes dividing in your head can be a difficult concept, so you can estimate when you do not know the exact answer to the problem.

#### Vocabulary

estimate, solutions, division

#### Modeling

**Step 1:** Begin by reviewing the concepts of division; **D**ivide, **M**ultiply, **S**ubtract, **B**ring- down.

Examples: **D**irty, **M**onkeys, **S**mell, **B**ad or **D**ad, **M**om, **S**ister, **B**rother

**Step 2:** Review the concept of estimating and or rounding.

When estimating in division, you are free to decide how to round the numbers. If the divisor is only one digit, do not round it, round the dividend.

**Step 3:** Work the following example with the students.

Mrs. Ling needs to know how many of the 164 books to put on three shelves. If each shelf is to hold about the same number of books, how many books will be on a shelf?

You could round to the nearest hundreds place before you divide. Or you could round to the nearest tens place. Which would be closer to the actual answer? When estimating you want to have an answer that will be close to the actual answer.

|                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Round:<br/>Nearest Hundred</p> $\begin{array}{r} 66 \\ 3 \overline{)200} \\ \underline{-18} \downarrow \\ 20 \\ \underline{-18} \\ 2 \end{array}$ |
|------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Round:<br/>Nearest Ten</p> $\begin{array}{r} 53 \\ 3 \overline{)160} \\ \underline{-15} \downarrow \\ 10 \\ \underline{-9} \\ 1 \end{array}$ |
|-------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Actual<br/>Answer</p> $\begin{array}{r} 54 \\ 3 \overline{)164} \\ \underline{-15} \downarrow \\ 14 \\ \underline{-12} \\ 2 \end{array}$ |
|---------------------------------------------------------------------------------------------------------------------------------------------|

## Teacher's Guide 5.N.1.1

Comparing the three divisions, you see rounding to the nearest tens place in the dividend gives a very close estimate. Remember to round to the greatest place value unless instructions differ.

**Step 4:** To estimate and find the quotient of a division problem, you need to find compatible numbers.

Example:  $53 \overline{)378}$

- 1) Round the divisor 53 to 50.
- 2) Find a compatible number for 50. Think of the multiples of 50 or the multiples of 5.  
 $\{5, 10, 15, 20, 25, 30, 35, 40\}$
- 3) The multiple 35 is as close as possible without going over 37 in the dividend 378.
- 4) Round the dividend 378 to 350. Using normal rounding rules, you would round 378 to 380. You round down to 350 because you want a number compatible to 50.
- 5) The estimated division problem will be:

$$50 \overline{)350}$$

- 6) The estimated quotient would be 7.

$$\begin{array}{r} 7 \\ 50 \overline{)350} \end{array}$$

- 7) Check the estimated quotient by multiplying  $7 \times 50 = 350$

**Step 5:** Using the following phrases will help students remember rounding.

“Five and above; give it a shove. Four or less; give it a rest.”

## Teacher's Guide 5.N.1.1

### Extension Activities

<http://okmathframework.pbworks.com/w/page/111920395/5-N-1-1>

“Division: Using Rounding to Estimate Quotients” by Tim Bedley on YouTube®

<https://www.youtube.com/watch?v=vGUG34ammVo>

“Compensation Strategy for Division,” by Susan Burke on YouTube®

<https://www.youtube.com/watch?v=jk7bBMmg8m0>

“Estimate Partial Quotients to Divide 2 Digit Divisors” using compatible numbers on YouTube®

[https://www.youtube.com/watch?v=ZtKt3D9DfAw&list=PLKi4Wtp6PRGUWQxEfrZZTXOVF\\_I04fpeV&index=21](https://www.youtube.com/watch?v=ZtKt3D9DfAw&list=PLKi4Wtp6PRGUWQxEfrZZTXOVF_I04fpeV&index=21)

## Answer Key 5.N.1.1

### Guided Practice

1. 7, ex: 420, 60
2. 3, ex: 90, 30
3. 18, ex: 900, 50
4. 5, ex: 300, 60
5. 15, ex: 600, 40
6. 9, ex: 90, 10
7. 6
8. 13
9. 10 stops
10. 6

### Independent Practice

1. 15 bracelets
2. 30 classes
3. \$8
4. 4 hours
5. 5 boxes
6.  $300 \div 20 = 15$  pieces
7. 50 tables
8. 25 miles
9. 50 stars
10. 100 books
11. 17 (Compatible Numbers) or 17.5 (Greatest Place Value)
12. 5
13. 10
14. 20
15. 30
16.  $300 \div 50 = 6$  or  $350 \div 50 = 7$
17.  $560 \div 70 = 8$
18.  $360 \div 60 = 6$
19.  $450 \div 90 = 5$
20.  $640 \div 80 = 8$



## Answer Key 5.N.1.1

### Continuous Review

(4.N.1.4) 1. 20

(4.N.1.4) 2. 180

(4.N.1.4) 3. 10

(4.N.1.4) 4. 650

(4.N.1.4) 5. 910

(5.N.1.1) 6.  $20 \div 10 = 2$

(5.N.1.1) 7.  $400 \div 20 = 20$

(5.N.1.1) 8.  $200 \div 10 = 20$

(5.N.1.1) 9.  $90 \div 9 = 10$

(5.N.1.1) 10.  $20 \div 4 = 5$

**5.N.1.1 Estimate solutions to division problems in order to assess the reasonableness of results.**

**Real-World Connections**

You will use division in your everyday life more than you realize. Division is the idea of separating, or dividing, parts of a whole. Sometimes dividing in your head can be a difficult concept, so you can estimate when you do not know the exact answer to the problem. For example, if you mow lawns during the summer, you could make \$148 in one week. If you charge around \$26 for each lawn, how many lawns did you mow? This can be difficult to do in your head, so you can use estimation to help solve problems in your everyday lives.

**Vocabulary**

|                 |                                                             |
|-----------------|-------------------------------------------------------------|
| <b>estimate</b> | to make an approximate calculation, often based on rounding |
| <b>solution</b> | the answer to a problem                                     |
| <b>division</b> | sharing or grouping a number to equal parts                 |

**Examples**

This is a review of dividing whole numbers.

1. How many 16s are in 5? 0. Move to the next place.

2. How many 16s are in 56? 3

5. How many 16s are in 80? 5

$$\begin{array}{r}
 16 \overline{) 560} \\
 \underline{48} \phantom{0} \\
 80 \phantom{0} \\
 \underline{80} \\
 0
 \end{array}$$

3. Multiply 3 by 16; then subtract

4. Bring down the 0.

6. Multiply 5 and 16; then subtract

7. Remainder (must be less than the divisor)

**Example** *Estimating Quotients*

Use rounding to estimate the following quotient mentioned in your real-world connections.

***Remember: 5 or higher, round up    4 or below, round down***

$$148 \div 26$$

For this problem, use your knowledge of compatible numbers, and round 148 to 150 and 26 to 30.

$$*148 \text{ rounds to } 150$$

$$*26 \text{ rounds to } 30$$

$$*150 \div 30 = ?$$

The estimated quotient is about 5 lawns.

Now you try it!

$$188 \div 36 \approx$$

$$*188 \text{ rounds to } 200$$

$$*36 \text{ rounds to } 40$$

$$*200 \div 40 = ?$$

**Guided Practice (5.N.1.1)**

Name: \_\_\_\_\_

*Round to greatest place value or compatible numbers to estimate the answers.*

1.  $418 \div 64 \approx$  \_\_\_\_\_ ex: 418 rounds to \_\_\_\_\_ 64 rounds to \_\_\_\_\_

2.  $92 \div 33 \approx$  \_\_\_\_\_ ex: 92 rounds to \_\_\_\_\_ 33 rounds to \_\_\_\_\_

3.  $912 \div 49 \approx$  \_\_\_\_\_ ex: 912 rounds to \_\_\_\_\_ 49 rounds to \_\_\_\_\_

4.  $278 \div 58 \approx$  \_\_\_\_\_ ex: 278 rounds to \_\_\_\_\_ 58 rounds to \_\_\_\_\_

5.  $623 \div 37 \approx$  \_\_\_\_\_ ex: 623 rounds to \_\_\_\_\_ 37 rounds to \_\_\_\_\_

6.  $87 \div 11 \approx$  \_\_\_\_\_ ex: 87 rounds to \_\_\_\_\_ 11 rounds to \_\_\_\_\_

*For questions 7 through 10, round to the greatest place value to estimate the answers.*

7. There are 282 toothpicks. They need to be bundled in groups of 46. About how many bundles can be made? \_\_\_\_\_
  
8. Sean has 371 marbles. He plans to put 29 marbles in each storage bag. Approximately how many storage bags will Sean need? \_\_\_\_\_
  
9. Jerimiah and his family are going on a road trip. The trip is 723 miles long. They want to stop every 68 miles. About how many stops will they make? \_\_\_\_\_
  
10. Johnson's hardware purchased a bag of 499 nails. They are selling them in packages of 81 nails. About how many packages of nails will they have to sell?  
\_\_\_\_\_

**5.N.1.1 Estimate solutions to division problems in order to assess the reasonableness of results.**

*For questions 1 through 5, round to the greatest place value to estimate the answers.*

1. Katie makes charm bracelets. She uses 17 charms for each bracelet. About how many charm bracelets can Katie make using the 312 charms she has?  
\_\_\_\_\_
2. Harlow Elementary Schools has 598 students enrolled. Each class has an average of 24 students. About how many classes does Harlow Elementary School have? \_\_\_\_\_
3. Eric worked in his yard 48 total hours for extra spending money. His dad paid him by the hour. He earned \$413 dollars. About how much is his hourly pay?  
\_\_\_\_\_
4. The Allen family is planning a vacation 215 miles away from their home. They drive an average of 50 miles every hour. About how many hours will it take the Allen family to travel to their destination? \_\_\_\_\_
5. Rachel is packing in her room. She has 43 books to move. An average of 8 books will fit into a box. About how many boxes will Rachel need for her books? \_\_\_\_\_

*For questions 6 through 10, round to the greatest place value to estimate the answers.*

6. Tony wants to divide his bag of 270 pieces of candy equally with his 23 classmates. Estimate the number of pieces of candy each classmate will receive equally.

\_\_\_\_\_

7. Sara needs to seat 370 people. Each table seats 8 people. Estimate how many tables she will need to for the party.

\_\_\_\_\_

8. A hot air balloon traveled 116 miles in 4 hours. If the balloon traveled the same distance each hour, about how many miles per hour did it travel?

\_\_\_\_\_

9. The 5th-grade art class is working on a mosaic for a wall at the front entrance of the school. The design will have stars. Each star contains 6 triangles. About how many stars can be made with 280 triangles?

\_\_\_\_\_

10. There are 8 members in the High Five Reading Club. Altogether the members read a total of 782 books in two years. If each member read close to the same number of books, about how many books did each member read over this 2-year period?

\_\_\_\_\_

*Round to the greatest place value or compatible numbers to estimate the answers.*

11.  $679 \div 42 \approx$  \_\_\_\_\_

12.  $204 \div 37 \approx$  \_\_\_\_\_

**Independent Practice (5.N.1.1)**

Name \_\_\_\_\_

13.  $107 \div 12 \approx$  \_\_\_\_\_

14.  $987 \div 54 \approx$  \_\_\_\_\_

15.  $627 \div 19 \approx$  \_\_\_\_\_

*Use compatible numbers to solve.*

16.  $334 \div 48 \approx$  \_\_\_\_\_

17.  $582 \div 72 \approx$  \_\_\_\_\_

18.  $374 \div 61 \approx$  \_\_\_\_\_

19.  $463 \div 91 \approx$  \_\_\_\_\_

20.  $643 \div 79 \approx$  \_\_\_\_\_



# 5<sup>th</sup> Grade

# COMPREHENSIVE ASSESSMENT

1) Jesse's apple stand earned \$369 last week. He needs to split that equally with his 2 friends that helped him. How much money will Jesse and each of his friends get?

- A \$371 each
- B \$123 each
- C \$200 each
- D \$150 each

2) Mrs. Lake's class needs 360 pieces of paper for a project. There are 40 pieces of paper in a box. How many boxes of paper will Mrs. Lake's class need for the project?

- A 8 boxes
- B 9 boxes
- C 10 boxes
- D 12 boxes

3) What is the result of  $252 \div 7$ ?

- A 35 with the remainder of 4
- B 30 with the remainder of 2
- C 36
- D 31

4) Lindsey took \$20 to school for lunch. She bought a hamburger for \$3.50, a small order of French fries for \$1.99 and small drink for \$1.29. How much change should she receive?

- A \$13.22
- B \$15.00
- C \$21.29
- D \$6.78

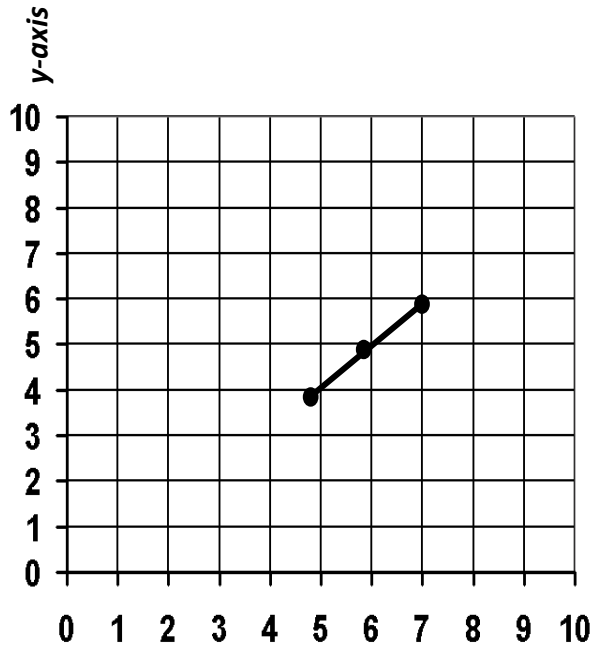
5) Sandy picks flowers every weekend at her grandmother’s house. For every flower she picks, more grow back in its place. If  $n$  represents a number in this pattern, which rule could be used to find the next number in the pattern?

- A  $n + 2$
- B  $n - 2$
- C  $n \cdot 2$
- D  $n \div 2$

8, 16, 32, 64, ...

6) Determine the value for  $n$  by finding the rule to the pattern.

| $x$ | $y$ |
|-----|-----|
| 5   | 2   |
| 6   | 3   |
| 7   | 4   |
| 8   | $n$ |



- A  $n = 8$
- B  $n = 5$
- C  $n = 4$
- D  $n = 6$

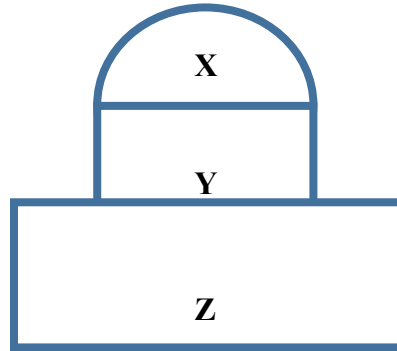
7) Solve the equation using the distributive property of multiplication?

$4 \times (2 + 7)$

- A 26
- B 46
- C 66
- D 36

- 48) A shape is created by combining semi-circle X, rectangle Y, and rectangle Z. X has a perimeter of 22 cm. Rectangle Y has the dimension 4 cm x 8 cm. Rectangle Z has a perimeter of 66 cm. What is the perimeter of the shape?

- A 70cm  
B 80 cm  
C 78 cm  
D 82cm



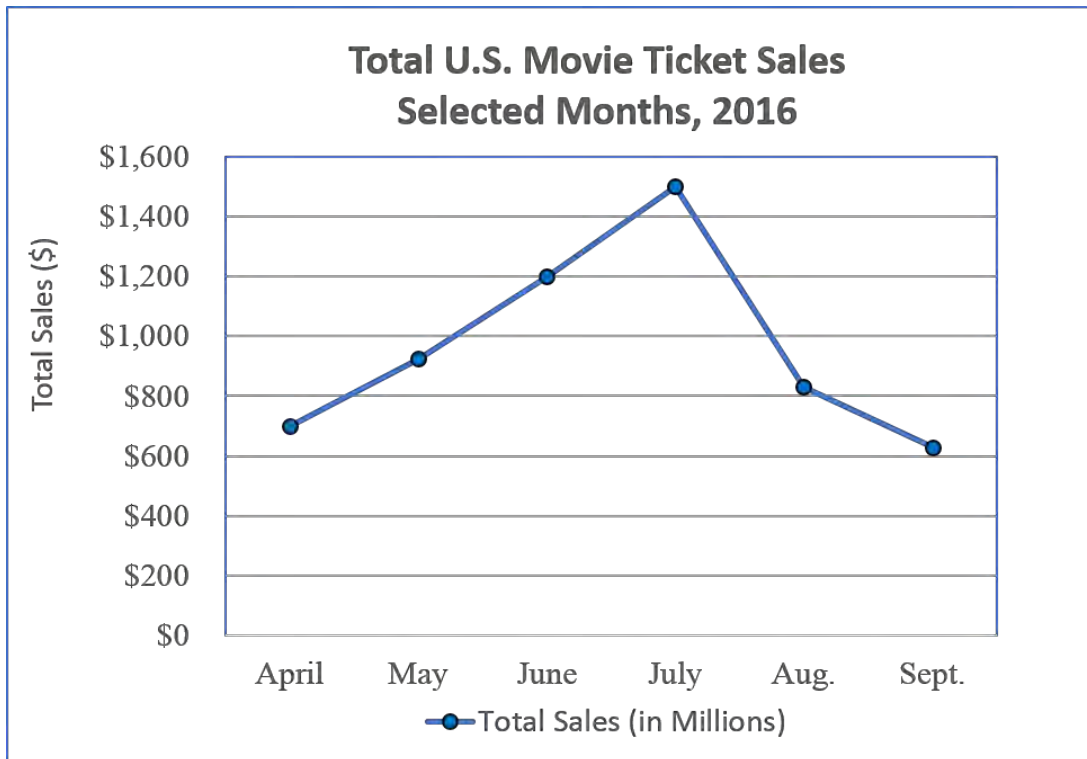
- 49) Ann took 5 tests this semester. Her scores are presented below.

|        |    |
|--------|----|
| Test 1 | 80 |
| Test 2 | 90 |
| Test 3 | 88 |
| Test 4 | 86 |
| Test 5 | 75 |

What was Ann's mean score for this semester?

- A 82.0  
B 87.2  
C 83.8  
D 81.5

50) The line graph below shows the total sales of movie tickets over six months.



Based on the information in the graph, approximately how much did ticket sales increase from June to July?

- A \$300,000,000
- B \$300
- C \$1,500,000,000
- D \$1,500

### A

**acute angle:** an angle with a measure greater than  $0^\circ$  but less than  $90^\circ$

**addends:** are the digits in an addition problem that are being added

**absolute value:** the absolute value of a real number is its (non-negative) distance from 0 on a number line; this is also known as magnitude

**addition:** to join two or more numbers or quantities to get one number called a sum or total

**additive comparison problems:** the underlying question is what amount would be added to one quantity to result in the other

**algebraic expression:** a mathematical phrase combining numbers and/or variables; an expression does not contain equality or inequality signs but may include other operators and grouping symbols; both sides of an equation are expressions

**algebraic equation:** includes mathematical signs, symbols, and numbers connected with an equal sign (=); an algebraic equation contains an equal sign

**algorithm:** a step-by-step process for solving a problem

**angle:** a figure formed by two rays with a common endpoint called the vertex and it is measured in degrees ( $^\circ$ )

**angle ruler:** similar to a protractor and is used to measure and draw angles

**analog clock:** a clock with hour, minute, and, sometimes, second hands

**approximation:** the estimate a number, amount or total, often rounding it off to the nearest 10 or 100

**area:** the space occupied by a flat shape (closed two-dimensional shape) or the surface of an object; the number of unit squares that cover the surface of a closed figure; measured in square units such as square centimeters, square feet, square inches, etc.

**area models:** a model using area to show multiplication or division

**area of a circle:** the area of the interior of the circle, which can be found with  $A = \pi r^2$  where  $r$  is the radius and  $\pi$  the irrational number “pi”

**area of a parallelogram:** the area of the interior of the parallelogram; is measured in square units; can be found by using the formula  $A = bh$

**area of similar triangles:** if two similar triangles have sides in the ratio  $x:y$ , then their areas are in the ratio  $x^2:y^2$

**area of a square or rectangle:** the area of the interior of the square or rectangle; is measured in square units; can be found by using the formula  $A = l \times w$  or  $A = lw$ ; area of a square can also be found using the formula  $A = s^2$

**area of a trapezoid:** the sum of its bases multiplied by the height of the trapezoid then divided by 2; the area is measured in square units and can be found using the formula  $A = \frac{1}{2}(b_1 + b_2)h$

## OAS Mathematics Glossary

**area of triangles:** amount of surface a triangle covers and measured in square units; can be found using the formula  $A = \frac{1}{2}bh$

**arrays:** an orderly arrangement of objects arranged in rows or columns

**ascending:** increasing in size

**ascending order:** numbers arranged from smallest to largest

**associative property of addition:** states that the sum remains the same regardless of how they are grouped,  $(a + b) + c = a + (b + c)$

**associative property of multiplication:** states that the product remains the same regardless of how they are grouped,  $(a \times b) \times c = a \times (b \times c)$

**attributes:** characteristics

**average:** a number expressing the central or typical value in a set of data, in particular- the mode, median, or most commonly the mean, which is found by dividing the sum of the values in the set by the number of values in the set

**axis:** a real or imaginary reference line

### B

**bar graph:** a graph that compares data from several situations using vertical or horizontal bars

**bar notation:** a horizontal bar over decimals to indicate that they repeat

**base:** the number or variable representing the factor being multiplied

**base area:** the area of the base denoted with  $B$

**base 10 blocks:** blocks which show base-10 number values

**base of a figure:** a face on which the 3D figure sits

**benchmark:** something by which other things can be measured or compared

**benchmark fractions:** fractions that are easy to visualize or represent, such as,  $\frac{1}{4}$ ,  $\frac{1}{3}$ ,  $\frac{1}{2}$ ,  $\frac{2}{3}$ , and  $\frac{3}{4}$

**biased:** sample in which individuals, items, or data were not equally likely to have been chosen

**box and whisker plot:** a diagram or graph using a number line to show the distribution of a set of data which displays the median, upper and lower quartiles, and the maximum and minimum values of the data

### C

**calculate:** to work something out, a mathematical operation

**calculator:** electronic device used for making mathematical calculations

**capacity:** the maximum amount or number that can be contained or accommodated

**cent:** equals one hundredth of a dollar (100 cents equal one dollar)

**centimeter:** a length of measurement that is equal to 1/100 (0.01) of a meter; it is part of the metric system of measurement, which is used around the world



## OAS Mathematics Glossary

**transversal:** a line that cuts across two or more (usually parallel) lines

**trapezoid:** a quadrilateral only having two sides that are parallel

**tree diagram:** a diagram shaped like a tree used to display sample space by using one branch for each possible outcome in a probability exercise

**triangle:** a polygon with three sides

**triangular prism:** a solid figure with two faces that are triangles

**triangular pyramid:** a solid figure where all the faces are triangles

**two-dimensional figure:** a figure having two dimensions of length and width

**two-step operation:** an equation that takes two steps to solve

### U

**unknowns:** are letters that represent a number that you do not know or an unknown quantity

**unit fractions:** a fraction with a numerator of 1, such as  $\frac{1}{3}$  or  $\frac{1}{5}$

**unit pricing:** a unit price compares the price of something to a unit of measurement; for example, cost per kilogram or cost per liter or gallon

**unit rate:** a comparison of two measurements in which one of the terms has value of one

**upper quartile:** the median of the upper half of data (Q2)

### V

**value:** the numerical worth or amount

**variable:** a symbol used to represent a quantity that can vary, or change; usually a letter but may also be a picture or box

**Venn diagram:** a diagram that uses circles that overlap to organize and show data

**vertex:** the point at which two or more-line segments, edges, lines, or ray meet to form an angle (plural: vertices)

**vertical:** in an up-down direction or position; upright.

**vertical angles:** pairs of opposite congruent angles formed by the intersection of straight lines and they share a common vertex

**vertices:** a point where:

- two or more rays or the sides of an angle meet
- the adjacent sides of a polygon meet
- the edges of a solid figure meet

**volume:** the number of cubic units needed to fill a solid figure (the formula for the volume of rectangular prisms is length  $\times$  width  $\times$  height also written as  $V = l \times w \times h$  or  $V = lwh$ )

### W

**weight:** how heavy an object is, such as ounce (oz), pound (lb), and ton (T)

**whole number:** positive numbers, including zero, without any decimal or fractional parts. (ex: 0, 1,2,3,4,5, ....)

**whole number exponents:** the numbers 0, 1, 2, 3...that indicate how many times the base is used as a factor, e.g., in  $4^3 = 4 \times 4 \times 4 = 64$ , the exponent 3, indicating that 4 is repeated as a factor three times

**wide division:** a strategy to use to solve division problems, instead of long division

**width:** breadth/distance across from side to side

**withdrawal:** money taken out of a bank or money removed from a saving account or a checking account

**word form:** a number written out in words to represent the value of the digits

**word problem:** a math problem presented as a scenario in text form with a variety of number sentences

### X

**x-axis:** the horizontal number line of a coordinate plane used to show horizontal distance

**x-coordinate:** the first number in an ordered pair, it shows the distance a point is along the horizontal axis

**x-intercept:** where the line crosses the  $x$ -axis,  $y = 0$ , when in standard form it is  $C/A$

### Y

**y-axis:** the vertical number line of a coordinate plane used to show vertical distance

**y-coordinate:** the second number in an ordered pair, it shows the distance a point is along the vertical axis

**y-intercept:** where the line crosses the  $y$ -axis,  $x = 0$ , when in standard form it is  $C/B$ , when in slope-intercept form it is  $b$

**yard:** 1 yard is equivalent to 3 feet or 36 inches

### Z

**zero:** the numeral 0, used as a place holder (nothing, none, nil, naught)



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