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TEACHER'S GUIDE

Math 3

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SUCCESS **OAS**
with

Oklahoma Academic Standards

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Math 3

**Ensuring Student Success
with
Oklahoma Academic Standards**

Written by Oklahoma Teachers for Oklahoma Teachers

Cassidy Cline



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SUCCESS *with* OAS

Math 3 by Cassidy Cline

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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**
**3rd grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                                                           | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 1               | 3.N.1.1          | Read, write, discuss, and represent whole numbers up to 100,000. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives.                           | 1                         | 1                        |
| 2               | 3.N.1.2          | Use place value to describe whole numbers between 1,000 and 100,000 in terms of ten thousands, thousands, hundreds, tens, and ones, including expanded form.                                                    | 24                        | 15                       |
| 3               | 3.N.1.3          | Find 10,000 more or 10,000 less than a given five-digit number. Find 1,000 more or 1,000 less than a given four- or five-digit number. Find 100 more or 100 less than a given four- or five-digit number.       | 35                        | 23                       |
| 4               | 3.N.1.4          | Use place value to compare and order whole numbers up to 100,000 using comparative language, numbers, and symbols.                                                                                              | 49                        | 31                       |
| 5               | 3.N.3.1          | Read and write fractions with words and symbols.                                                                                                                                                                | 63                        | 39                       |
| 6               | 3.N.3.2          | Construct fractions using length, set, and area models.                                                                                                                                                         | 76                        | 49                       |
| 7               | 3.N.3.3          | Recognize unit fractions and use them to compare and decompose fractions related to the same whole. Use the numerator to describe the number of parts and the denominator to describe the number of partitions. | 91                        | 59                       |
| 8               | 3.N.3.4          | Use models and number lines to order and compare fractions that are related to the same whole.                                                                                                                  | 104                       | 67                       |

**OAS Mathematics**
**Table of Contents**
**3rd grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                               | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 9               | 3.N.4.1          | Use addition to determine the value of a collection of coins up to one dollar using the cent symbol and a collection of bills up to twenty dollars. | 123                       | 79                       |
| 10              | 3.N.4.2          | Select the fewest number of coins for a given amount of money up to one dollar.                                                                     | 139                       | 91                       |
| 11              | 3.GM.1.1         | Sort three-dimensional shapes based on attributes.                                                                                                  | 155                       | 103                      |
| 12              | 3.GM.1.2         | Build a three-dimensional figure using unit cubes when a shape/picture is shown.                                                                    | 169                       | 113                      |
| 13              | 3.GM.1.3         | Classify angles as acute, right, obtuse, and straight.                                                                                              | 185                       | 125                      |
| 14              | 3.GM.2.1         | Find perimeter of polygon, given whole number lengths of the sides, in real-world and mathematical situations.                                      | 197                       | 135                      |
| 15              | 3.GM.2.4         | Choose an appropriate measurement instrument and measure the length of objects to the nearest whole yard, whole foot, or half-inch.                 | 212                       | 147                      |
| 16              | 3.GM.2.3         | Choose an appropriate measurement instrument and measure the length of objects to the nearest whole centimeter or meter.                            | 225                       | 153                      |
| 17              | 3.GM.2.5         | Using common benchmarks, estimate the lengths (customary and metric) of a variety of objects.                                                       | 230                       | 159                      |
| 18              | 3.GM.2.6         | Use an analog thermometer to determine temperature to the nearest degree in Fahrenheit and Celsius.                                                 | 239                       | 165                      |
| 19              | 3.GM.2.7         | Count cubes systematically to identify number of cubes needed to pack the whole or half of a three-dimensional structure.                           | 257                       | 177                      |



**OAS Mathematics**
**Table of Contents**
**3rd grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                                                                                                                                   | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 20              | 3.GM.3.1         | Read and write time to the nearest 5-minute (analog and digital).                                                                                                                                                                                                                       | 269                       | 187                      |
| 21              | 3.GM.3.2         | Determine the solutions to problems involving addition and subtraction of time in intervals of 5 minutes, up to one hour, using pictorial models, number line diagrams, or other tools.                                                                                                 | 284                       | 201                      |
| 22              | 3.N.2.3          | Use strategies and algorithms based on knowledge of place value and equality to fluently add and subtract multi-digit numbers.                                                                                                                                                          | 300                       | 213                      |
| 23              | 3.N.2.4          | Recognize when to round numbers and apply understanding to round numbers to the nearest ten thousand, thousand, hundred, and ten and use compatible numbers to estimate sums and differences.                                                                                           | 312                       | 221                      |
| 24              | 3.N.2.5          | Use addition and subtraction to solve real-world and mathematical problems involving whole numbers. Use various strategies, including the relationship between addition and subtraction, the use of technology, and the context of the problem to assess the reasonableness of results. | 324                       | 227                      |
| 25              | 3.N.2.1          | Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line and skip counting.                                                                                                    | 343                       | 239                      |
| 26              | 3.N.2.2          | Demonstrate fluency of multiplication facts with factors up to 10.                                                                                                                                                                                                                      | 364                       | 257                      |

**OAS Mathematics**
**Table of Contents**
**3rd grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                                                                                                     | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 27              | 3.GM.2.8         | Find the area of two-dimensional figures by counting total number of same size unit squares that fill the shape without gaps or overlaps.                                                                                                                 | 377                       | 265                      |
| 28              | 3.GM.2.2         | Develop and use formulas to determine the area of rectangles. Justify why length and width are multiplied to find the area of a rectangle by breaking the rectangle into one unit by one unit squares and viewing these as grouped into rows and columns. | 393                       | 277                      |
| 29              | 3.N.2.6          | Represent division facts by using a variety of approaches, such as repeated subtractions, equal sharing, and forming equal groups.                                                                                                                        | 408                       | 289                      |
| 30              | 3.N.2.7          | Recognize the relationship between multiplication and division to represent and solve real-world problems.                                                                                                                                                | 424                       | 301                      |
| 31              | 3.N.2.8          | Use strategies and algorithms based on knowledge of place value, equalities and properties of addition and multiplication to multiply a two-digit number by a one-digit number.                                                                           | 438                       | 311                      |
| 32              | 3.A.1.1          | Create, describe, and extend patterns involving addition, subtraction, or multiplication to solve problems in a variety of contexts.                                                                                                                      | 447                       | 317                      |
| 33              | 3.A.1.2          | Describe the rule (single operation) for a pattern from an input/output table or function machine involving addition, subtraction, or multiplication.                                                                                                     | 459                       | 325                      |

**OAS Mathematics**
**Table of Contents**
**3rd grade**

| Suggested Order | Objective Number | Objective Description                                                                                                                                                                                                                            | Teacher Guide Page Number | Student Book Page Number |
|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 34              | 3.A.1.3          | Explore and develop visual representations of growing geometric patterns and construct the next steps.                                                                                                                                           | 476                       | 339                      |
| 35              | 3.A.2.1          | Find unknowns represented by symbols in arithmetic problems by solving one-step open sentences (equations) and other problems involving addition, subtraction, and multiplication. Generate real-world situations to represent number sentences. | 491                       | 351                      |
| 36              | 3.A.2.2          | Recognize, represent, and apply the number properties (commutative, identity, and associative properties of addition and multiplication) using models and manipulatives to solve problems.                                                       | 502                       | 357                      |
| 37              | 3.D.1.1          | Summarize and contrast a data set with multiple categories using a frequency table, line plot, pictograph, and/or bar graph with scaled intervals.                                                                                               | 514                       | 367                      |
| 38              | 3.D.1.2          | Solve one and two step problems using categorical data represented with a frequency table, pictograph, or bar graph with scaled intervals.                                                                                                       | 533                       | 379                      |

## Teacher's Guide

### 3.N.3.2 Construct fractions using length, set, and area models.

#### Real-World Connections

Students will construct fraction models. This skill could be used in measurement. Have a group of four toy cars, one being red. Ask them how many cars are in the group; how many cars are red. This can be represented as  $\frac{1}{4}$  because 1 of 4 of the toy cars is red.

#### Vocabulary

fractions, length, set, area models

#### Modeling

**Step 1:** Make a representation of a given fraction  $\frac{1}{2}$  in multiple formats.



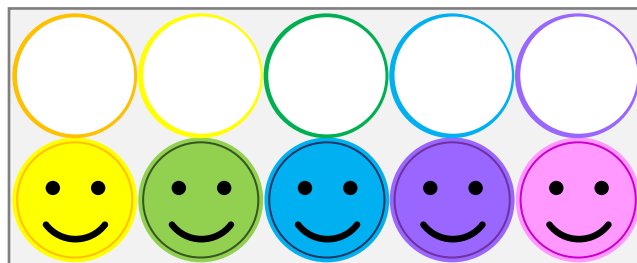
There were 8 slices of pizza,  $\frac{1}{2}$  of the pizza is left.



There were 12 eggs in the egg carton,  $\frac{1}{2}$  of the eggs are left.



There were 4 pieces of a chocolate candy bar,  $\frac{1}{2}$  of the candy bar is left.



There were 10 happy face stickers,  $\frac{1}{2}$  of the stickers are left.

### Teacher's Guide 3.N.3.2

Fractions can be represented multiple ways. They can be represented with manipulatives, numbers, etc....In this lesson students will learn how to represent fractions using length, set, and area models.

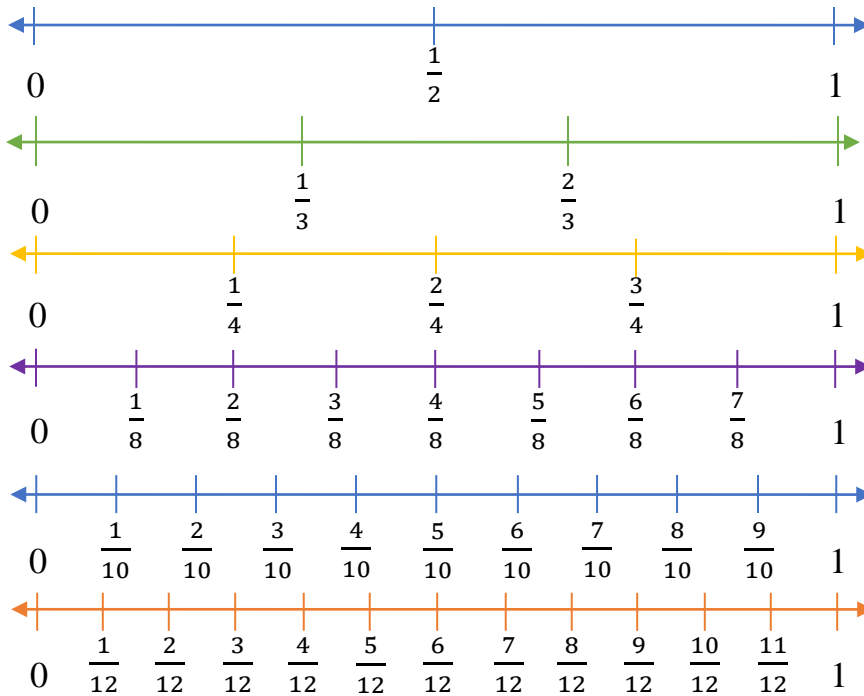
**Step 2:** Discuss representing fractions using length.

- Length can be shown using fraction strips:

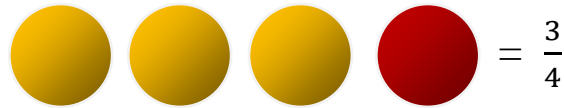
| 1 Whole        |                |                |                |                |                |                |                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| $\frac{1}{2}$  |                |                |                |                |                | $\frac{1}{2}$  |                |                |                |                |                |
| $\frac{1}{3}$  |                |                |                | $\frac{1}{3}$  |                |                |                | $\frac{1}{3}$  |                |                |                |
| $\frac{1}{4}$  |                |                | $\frac{1}{4}$  |                |                | $\frac{1}{4}$  |                |                | $\frac{1}{4}$  |                |                |
| $\frac{1}{8}$  |                | $\frac{1}{8}$  |                | $\frac{1}{8}$  |                | $\frac{1}{8}$  |                | $\frac{1}{8}$  |                | $\frac{1}{8}$  |                |
| $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ | $\frac{1}{10}$ |
| $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ | $\frac{1}{12}$ |

## Teacher's Guide 3.N.3.2

- Length can be shown using number lines:



- Length can be shown using counters:

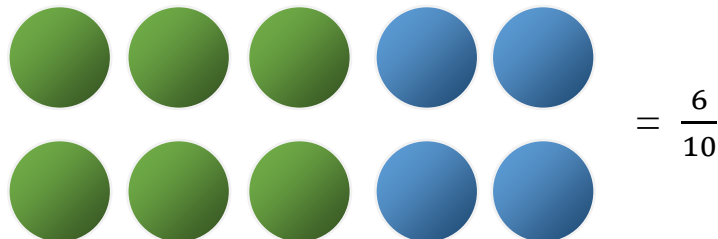


- There are 3 yellow counters out of 4 counters total. 3 is the numerator and 4 is the denominator.

**Step 3:** Discuss representing fractions using a set.

You can have a set of anything you would like to use, however, make sure the students know the set represents 1 whole.

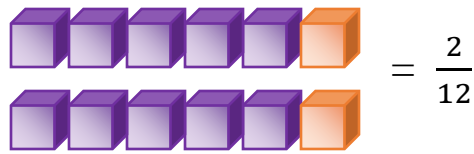
- A set can be represented by counters:



- There are 6 green counters out of 10 total counters. 6 is the numerator and 10 is the denominator.

## Teacher's Guide 3.N.3.2

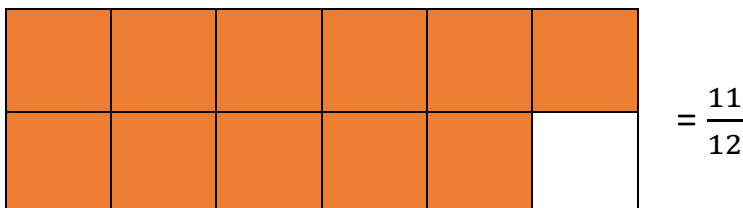
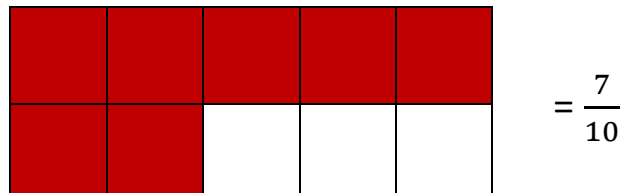
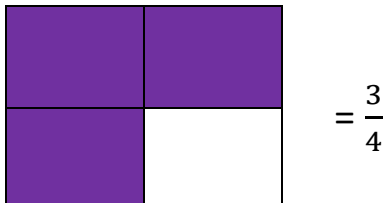
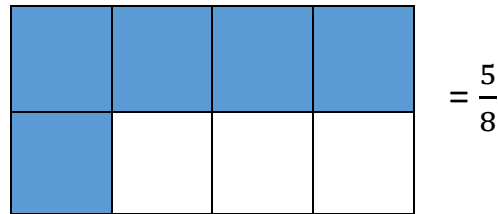
- A set can be represented by unit cubes:



- There are 2 orange unit cubes out of 12 unit cubes total. 2 is the numerator and 12 is the denominator.
- A fraction set model can be represented by any pictures with common attributes. Examples: fish, dogs, insects, chickens, fruit, pizza, etc.... The possibilities are endless if they represent one whole.

**Step 4:** Discuss representing fractions using area models.

Area models are represented by the portion of area shaded compared with the total area possible.



## Teacher's Guide 3.N.3.2

### Extension Activities

Flip over a card showing a picture of a fraction, and have each student write the fraction in number and word form.

Give students fractions which are not colored, and have them color in the picture to match a given fraction.

Oklahoma State Department of Education objective analysis of 3.N.3.2

<http://okmathframework.pbworks.com/w/page/112827250/3-N-3-2>

Encourage students to use visuals when working with fractions; go to:

<http://3-5cctask.ncdpi.wikispaces.net/3.NF.1-3.NF.3>



## Answer Key 3.N.3.2

### Guided Practice

1.  $\frac{2}{8}$

2.  $\frac{1}{4}$

3.  $\frac{3}{8}$

4.  $\frac{1}{3}$

5.  $\frac{2}{6}$

6.  $\frac{4}{12}$

7.  $\frac{1}{12}$

8.  $\frac{8}{12}$

9.  $\frac{5}{12}$

10.  $\frac{9}{12}$

### Independent Practice

1.  $\frac{3}{4}$

2.  $\frac{2}{3}$

3.  $\frac{3}{4}$

4.  $\frac{2}{4}$

5.  $\frac{4}{10}$

6.  $\frac{1}{4}$

7.  $\frac{3}{8}$

8.  $\frac{2}{3}$

9.  $\frac{3}{12}$

10.  $\frac{5}{10}$

## Answer Key 3.N.3.2

### Independent Practice

11. 1

12. 3

13.  $\frac{5}{10}$

14.  $\frac{3}{8}$

15.  $\frac{2}{10}$

16.  $\frac{7}{10}$

17.  $\frac{5}{10}$

18.  $\frac{1}{8}$

19.  $\frac{4}{8}$

20.  $\frac{5}{8}$

### Continuous Review

1. (3.N.3.1) Check drawings for accuracy.
2. (3.N.3.1) Check drawings for accuracy.
3. (3.N.3.1) Check drawings for accuracy.
4. (3.N.1.4) 9,601; 9,610; 9,651
5. (3.N.1.4) 8,887; 18,888; 58,889
6. (3.N.1.4) 7,413; 7,513; 7,553
7. (3.N.1.3) 5,317; 5,517; 4,417; 6,417
8. (3.N.1.3) 6,887; 7,087; 5,987; 7,987
9. (3.N.1.2) 15,218; 35,218
10. (3.N.1.2)  $8,000+700+20+7$

**3.N.3.2 Construct fractions using length, set, and area models.**

**Real-World Connections**

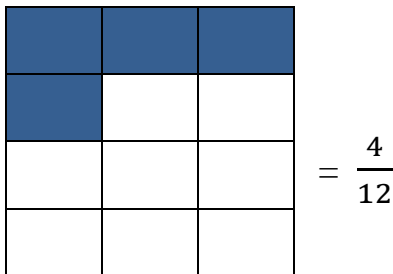
Cut paper strips into  $\frac{1}{4}$  foot pieces for an art project. You need to cut another strip of paper  $\frac{3}{4}$  of a foot long. Lay three of the  $\frac{1}{4}$  foot pieces end to end adding up to  $\frac{3}{4}$  foot. Would this help guide you in cutting a strip  $\frac{3}{4}$  foot long?

**Vocabulary**

|                  |                                                        |
|------------------|--------------------------------------------------------|
| <b>fractions</b> | a number that expresses parts of a whole or a set      |
| <b>length</b>    | distance from one end to the other                     |
| <b>set</b>       | a set is a collection of items with one of each member |

Example:

Area Model

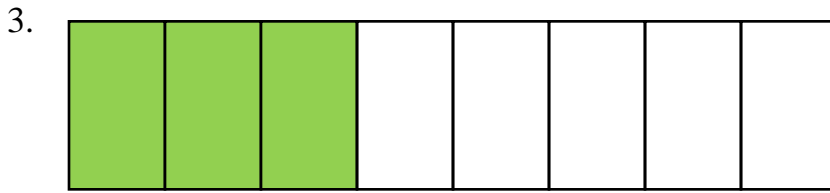


Write a fraction that names the shaded part of each set.

1. \_\_\_\_\_

2. \_\_\_\_\_

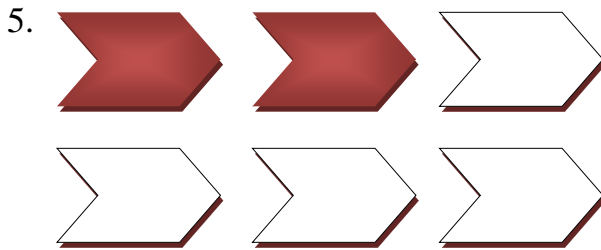
Write a fraction that names the shaded part of each set.



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

Answer the following questions using your understanding of fractions.

**Anna has a bag of 12 buttons. She has 4 red buttons, 1 yellow button, 3 green buttons, and 4 orange buttons.**

6. What fraction of Anna's buttons are red? \_\_\_\_\_

7. What fraction of Anna's buttons are yellow? \_\_\_\_\_

8. What fraction of Anna's buttons are not orange? \_\_\_\_\_

*Answer the following questions using your understanding of fractions.*

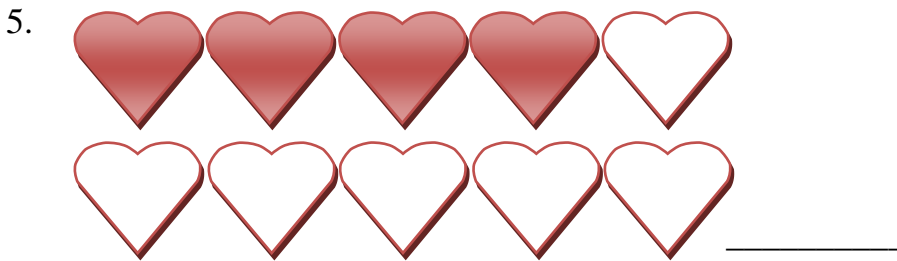
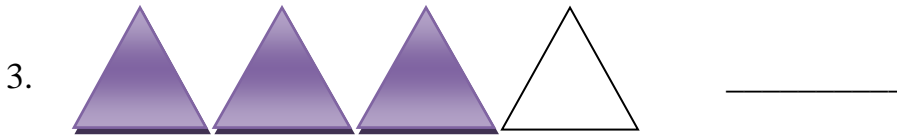
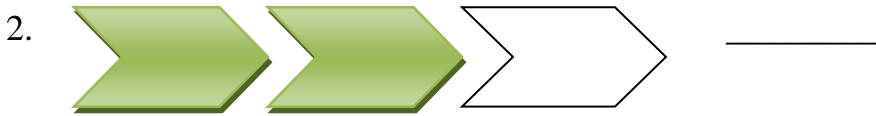
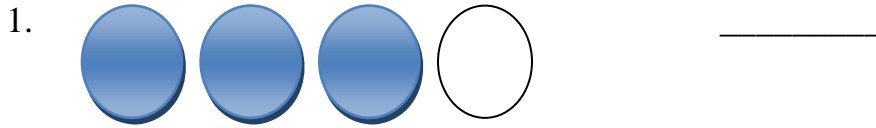
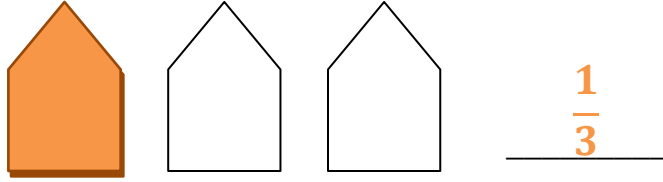
**Anna has a bag of 12 buttons. She has 4 red buttons, 1 yellow buttons, 3 green buttons, and 4 orange buttons.**

9. What fraction of Anna's buttons are red or yellow? \_\_\_\_\_
10. What fraction of Anna's buttons are not green? \_\_\_\_\_

**3.N.3.2 Construct fractions using length, set, and area models.**

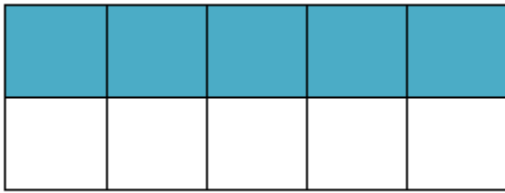
Write a fraction that names the shaded part of each set.

**Example:**



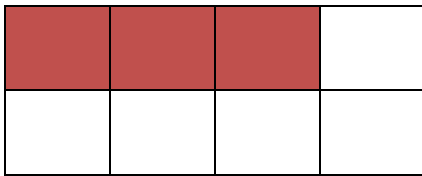
Write a fraction that names the shaded part of area model.

**Example:**



$$\frac{5}{10}$$

7.



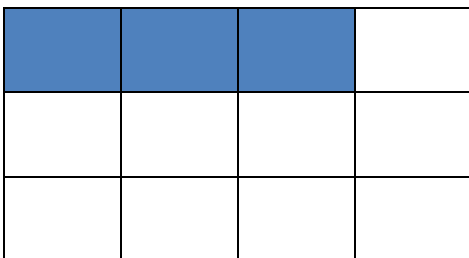
\_\_\_\_\_

8.



\_\_\_\_\_

9.



\_\_\_\_\_

Answer the following questions using your understanding of fractions.

**Example:** Phillip has 8 teddy bears. Four are brown, 2 are blue, and 2 are white. What fraction of the bears are brown?

$$\frac{4}{8}$$

10. Cooper has a group of 10 toy cars. One half are red. How many cars are red?  
\_\_\_\_\_
11. Hadley has a bouquet of 3 flowers. One third of the flowers are pink. How many flowers are pink? \_\_\_\_\_
12. Corbyn has a necklace of 12 beads. One fourth of the beads are green. How many beads are green? \_\_\_\_\_
13. Claylan has 10 marbles. Two are green, 3 are red, and 5 are yellow. What fraction of the marbles are yellow? \_\_\_\_\_
14. There are 8 cards in a stack. Three are striped and five are solid. What fraction of the cards are striped? \_\_\_\_\_



Answer the following question using your understanding of fractions.

**Example:**

Kendra has 8 pieces of colored paper. Three are pink, 2 are orange, and 3 are green.

What fraction of the paper is orange?

$$\frac{2}{8}$$

A gumball machine has 10 gumballs. Three are red, 2 are blue, 2 are white, and 3 are yellow.


- 15. What fraction of the gumballs are white? \_\_\_\_\_
- 16. What fraction of the gumballs are not red? \_\_\_\_\_
- 17. What fraction of the gumballs are blue or yellow? \_\_\_\_\_

Keelie has 1 pair of striped socks, 2 pairs of polka dotted socks, 3 pairs of heart socks, and 2 pairs of solid socks.

- 18. What fraction of her socks are striped? \_\_\_\_\_
- 19. What fraction of her socks are polka dotted or solid? \_\_\_\_\_
- 20. What fraction of her socks are not heart socks? \_\_\_\_\_

Divide and shade the rectangle to show the fraction given

1.  $\frac{1}{3}$  

2.  $\frac{3}{4}$  

3.  $\frac{1}{2}$  

Place the sets of numbers in order from least to greatest.

4. 9,610; 9,601; 9,651 \_\_\_\_\_

5. 58,889; 8,887; 18,888 \_\_\_\_\_

6. 7,553; 7,413; 7,513 \_\_\_\_\_

Write 100 less and 100 more than the number, write 1,000 less and 1,000 more than the number, then write 10,000 less and 10,000 more than the number.

|           | 100 less    | 100 more    | 1,000 less                      | 1,000 more                      |
|-----------|-------------|-------------|---------------------------------|---------------------------------|
| 7. 5,417  |             |             |                                 |                                 |
| 8. 6,987  |             |             |                                 |                                 |
|           | 10,000 less | 10,000 more |                                 |                                 |
| 9. 25,218 |             |             | <del>                    </del> | <del>                    </del> |

Write the number in expanded form.

10. 8,727 \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

### 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

# 3rd GRADE

# COMPREHENSIVE ASSESSMENT

*Following are examples of questions from the end-of-year summative assessment in the back of the Teacher's Guide.*

12. Which division fact represents the equal groups shown?



(A)  $9 \div 3 = 3$

(B)  $4 \times 3 = 12$

(C)  $12 \div 3 = 4$

(D)  $3 \times 3 = 9$

13. Jenna made 20 goody bags for the class party. She placed 4 bags on each table. How many tables were there in the classroom?

(A) 6

(B) 80

(C) 5

(D) 8

14. Solve.

$$\begin{array}{r} 34 \\ \times 7 \\ \hline \end{array}$$

(A)  $34 + 34 + 34 + 34 + 34 + 34$

(B)  $34 + 34 + 34 + 34 + 34 + 34 + 34$

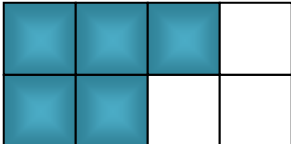
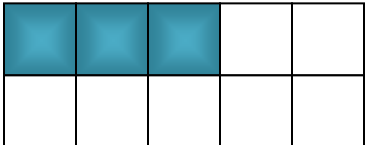
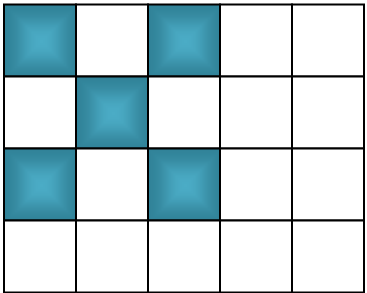
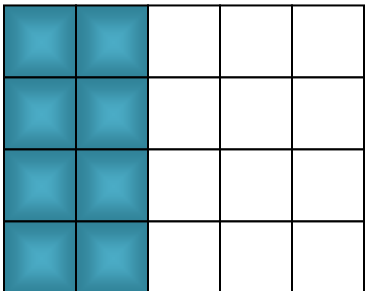
(C)  $7 + 7 + 7 + 7 + 7 + 7 + 7$

(D)  $34 + 34 + 34 + 34 + 34 + 34 + 34 + 34$

15. What is the value of the fraction  $\frac{3}{4}$ ?

- (A) one half
- (B) four thirds
- (C) three fourths
- (D) one fourth

16. Which area model represents  $\frac{5}{8}$ ?

- (A) 
- (B) 
- (C) 
- (D) 

17. Decompose  $\frac{4}{10}$

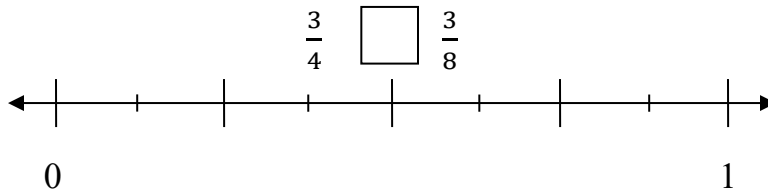
(A)  $\frac{4}{10} + \frac{4}{10} + \frac{4}{10} + \frac{4}{10}$

(B)  $\frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10}$

(C)  $\frac{2}{10} + \frac{2}{10}$

(D)  $\frac{3}{10} + \frac{1}{10}$

18. Determine if  $\frac{3}{4}$  is greater than, less than, or equal to  $\frac{3}{8}$ .



(A) = equal to

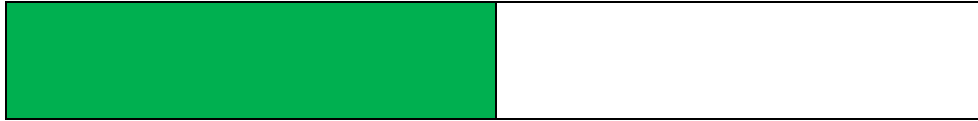
(B) < less than

(C) > greater than



19. Order the fractions from greatest to least.

$$\frac{1}{2}, \frac{2}{3}, \frac{3}{8}, \frac{7}{12}$$



Ⓐ  $\frac{3}{8}, \frac{1}{2}, \frac{7}{12}, \frac{2}{3}$

Ⓑ  $\frac{1}{2}, \frac{2}{3}, \frac{3}{8}, \frac{7}{12}$

Ⓒ  $\frac{7}{12}, \frac{3}{8}, \frac{2}{3}, \frac{1}{2}$

Ⓓ  $\frac{2}{3}, \frac{7}{12}, \frac{1}{2}, \frac{3}{8}$

22. How much money is shown below?



- (A) \$12.00
- (B) 17¢
- (C) \$17.00
- (D) \$4.00

| Animals at the Farm |    |
|---------------------|----|
| Cows                | 12 |
| Chickens            | 25 |
| Horses              | 7  |
| Goats               | 23 |
| Pigs                | 11 |

50. How many fewer horses are there than cows?

- (A) 8 horses
- (B) 2 horses
- (C) 19 horses
- (D) 5 horses





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