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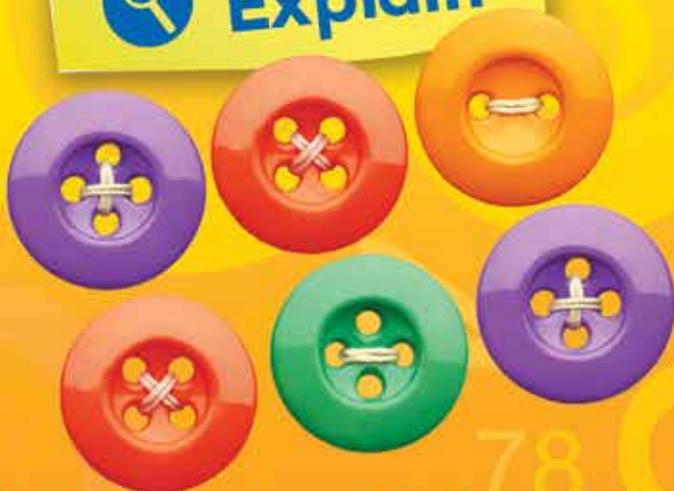
PRACTICE - ASSESS - DIAGNOSE

Level

1

180 Days of PROBLEM SOLVING for First Grade

- Think
- Plan
- Solve
- Explain



$$16 - 10 = 6$$

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INTRODUCTION

The Need for Practice

To be successful in today’s mathematics classrooms, students must deeply understand both concepts and procedures so that they can discuss and demonstrate their understanding during the problem-solving process. Demonstrating understanding is a process that must be continually practiced for students to be successful. Practice is especially important to help students apply their concrete, conceptual understanding during each step of the problem-solving process.

Understanding Assessment

In addition to providing opportunities for frequent practice, teachers must be able to assess students’ problem-solving skills. This is important so that teachers can adequately address students’ misconceptions, build on their current understandings, and challenge them appropriately. Assessment is a long-term process that involves careful analysis of student responses from discussions, projects, practice pages, or tests. When analyzing the data, it is important for teachers to reflect on how their teaching practices may have influenced students’ responses and to identify those areas where additional instruction may be required. In short, the data gathered from assessments should be used to inform instruction: slow down, speed up, or reteach. This type of assessment is called *formative assessment*.

HOW TO USE THIS BOOK *(cont.)*

College-and-Career Readiness Standards

Below is a list of mathematical standards that are addressed throughout this book. Each week students solve problems related to the same mathematical topic.

Week	Standard
1	Count to 50, starting at any number less than 50.
2	Count to 120, starting at any number less than 120.
3	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
4	Understand that the two digits of a two-digit number represent amounts of tens and ones. Ten can be thought of as a bundle of ten ones—called a “ten.”
5	Understand that the two digits of a two-digit number represent amounts of tens and ones. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
6	Understand that the two digits of a two-digit number represent amounts of tens and ones. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
7	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.
8	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
9	Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$.
10	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
11	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
12	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
13	Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.

HOW TO USE THIS BOOK *(cont.)*

14	Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
15	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on and making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$).
16	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$).
17	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$).
18	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).
19	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.
20	Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.
21	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
22	Add within 100, including adding a two-digit number and a one-digit number, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
23	Add within 100, including adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
24	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
25	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

HOW TO USE THIS BOOK *(cont.)*

26	Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
27	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
28	Order three objects by length.
29	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
30	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.
31	Tell and write time in hours and half-hours using analog and digital clocks.
32	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
33	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) to create a composite shape, and compose new shapes from the composite shape.
34	Compose three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.
35	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of.
36	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

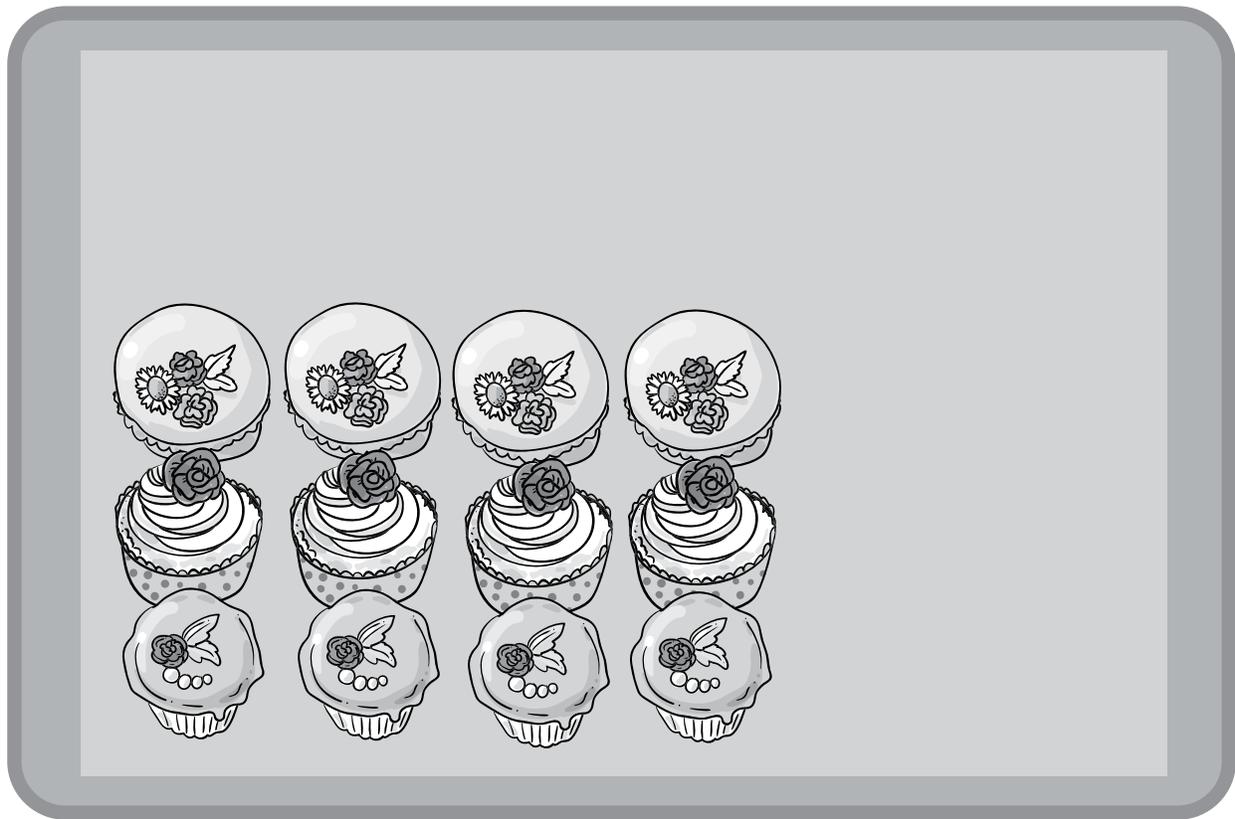
Name: _____



Think about the problem. Draw a picture to show what is happening.



Lee is making cupcakes for her birthday party. She puts 12 cupcakes on a tray. Then, she adds 6 more. How many cupcakes does Lee have now?



Think About It!

Name: _____

 **DIRECTIONS:** Read and solve the problem.

Solve It!

Problem: Connor is counting his toy cars. He counts 10 toy cars. Then, he counts 7 more. How many toy cars does Connor have now?

**What Do You Know?**

Draw a picture to show the problem.

**What Is Your Plan?**

How will you count?

**Solve the Problem!**

_____ toy cars

Name: _____

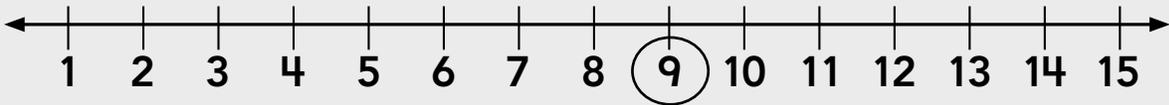


Look at the example. Then, solve the problem.



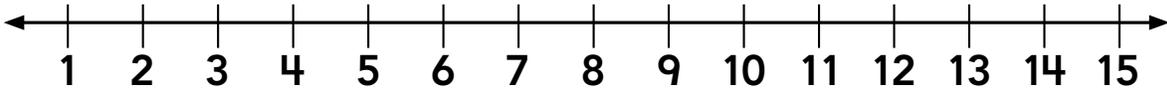
Picture It!

Example: How many apples are there?



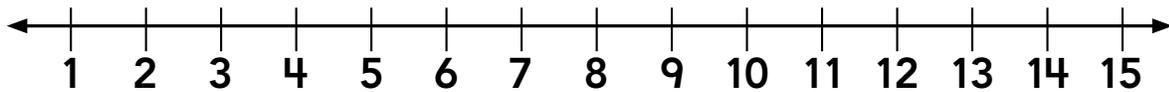
9 apples

1. How many muffins are there?



_____ muffins

2. How many bananas are there?

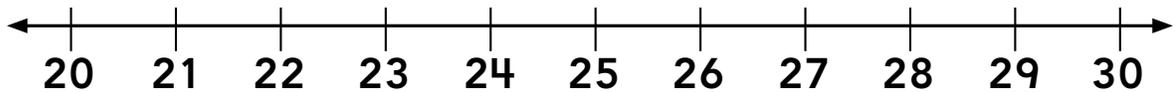


_____ bananas

Name: _____

DIRECTIONS: Solve the problem using the number line.

Tim is having a yard sale. He sells 20 books. Then, he sells 6 more. How many books does Tim sell?



_____ books

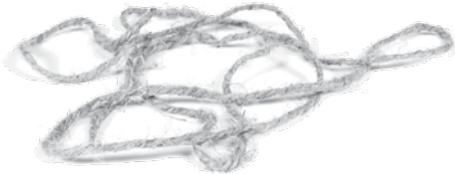


Draw It!

Name: _____

DIRECTIONS: Read and solve the problem.

A group of children want to make face art. Each child needs 1 piece of yarn and 2 wiggly eyes.

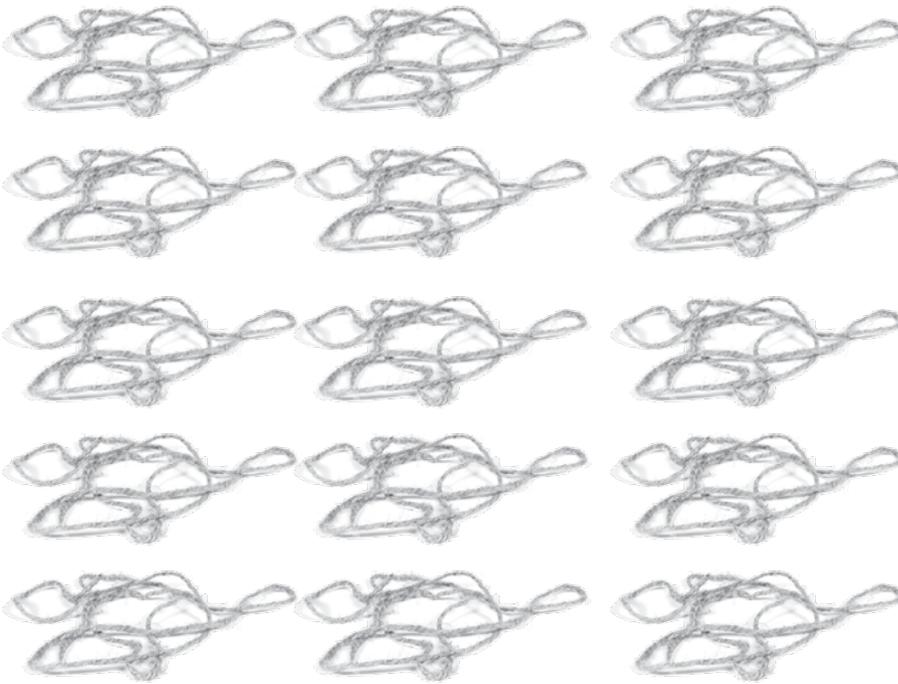


yarn



wiggly eyes

How many children can make face art?



— — —
_____ children

Challenge Yourself!

PROBLEM-SOLVING FRAMEWORK

Use the following problem-solving steps to help you:

1. understand the problem
2. make a plan
3. solve the problem
4. check your answer and explain your thinking



What Do You Know?

- read the problem
- say the problem in your own words
- picture the problem
- find the important information
- understand the question

What Is Your Plan?

- draw a picture or model
- choose a strategy
- choose an operation (+, -)
- decide how many steps there are



Solve the Problem!

- carry out your plan
- check your steps
- decide if your strategy works or choose a new strategy
- find the answer



Look Back and Explain!

- check your answer to see if it makes sense
- decide if there are other possible answers
- use words to explain your answer