PRACTICE ‑ ASSESS ‑ DIAGNOSE

Level
K

180 Days of PROBLEM SOLVING
for Kindergarten

- **?** Think
- **Plan**
- **Solve**
- **Explain**

$$2 + 2 = 4$$

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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 5 by ones.
2	Count to 10 by ones.
3	Count to answer "how many?" questions about as many as 10 things arranged in a line, a rectangular array, or a circle, or in a scattered configuration; given a number from 1–10, count out that many objects.
4	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
5	Understand the relationship between numbers and quantities; connect counting to cardinality. Understand that each successive number name refers to a quantity that is one larger.
6	Write numbers from 0 to 5. Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects). Understand the relationship between numbers and quantities; connect counting to cardinality.
7	Write numbers from 6 to 10. Represent a number of objects with a written numeral 6–10. Understand the relationship between numbers and quantities; connect counting to cardinality.
8	Write numbers from 11 to 20. Represent a number of objects with a written numeral 11–20. Understand the relationship between numbers and quantities; connect counting to cardinality.
9	Count to 100 by tens.
10	Identify whether the number of objects in one group is equal to the number of objects in another group, e.g., by using matching and counting strategies.
11	Identify whether the number of objects in one group is greater than the number of objects in another group, e.g., by using matching and counting strategies.
12	Identify whether the number of objects in one group is less than the number of objects in another group, e.g., by using matching and counting strategies.
13	Compare two numbers between 1 and 5 presented as written numerals.

14	Compare two numbers between 1 and 10 presented as written numerals.
15	Classify objects by size; count the numbers of objects in each category and sort the categories by count.
16	Classify objects by color; count the numbers of objects in each category and sort the categories by count.
17	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
18	Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
19	Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.
20	Represent addition with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. Fluently add within 5.
21	Represent addition with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. Add within 10.
22	Solve addition word problems, and add and within 10, e.g., by using objects or drawings to represent the problem
23	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).
24	For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
25	Represent subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. Fluently subtract within 5.
26	Represent subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. Subtract within 10.
27	Represent subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. Solve subtraction word problems, and subtract within 10.
28	Compose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

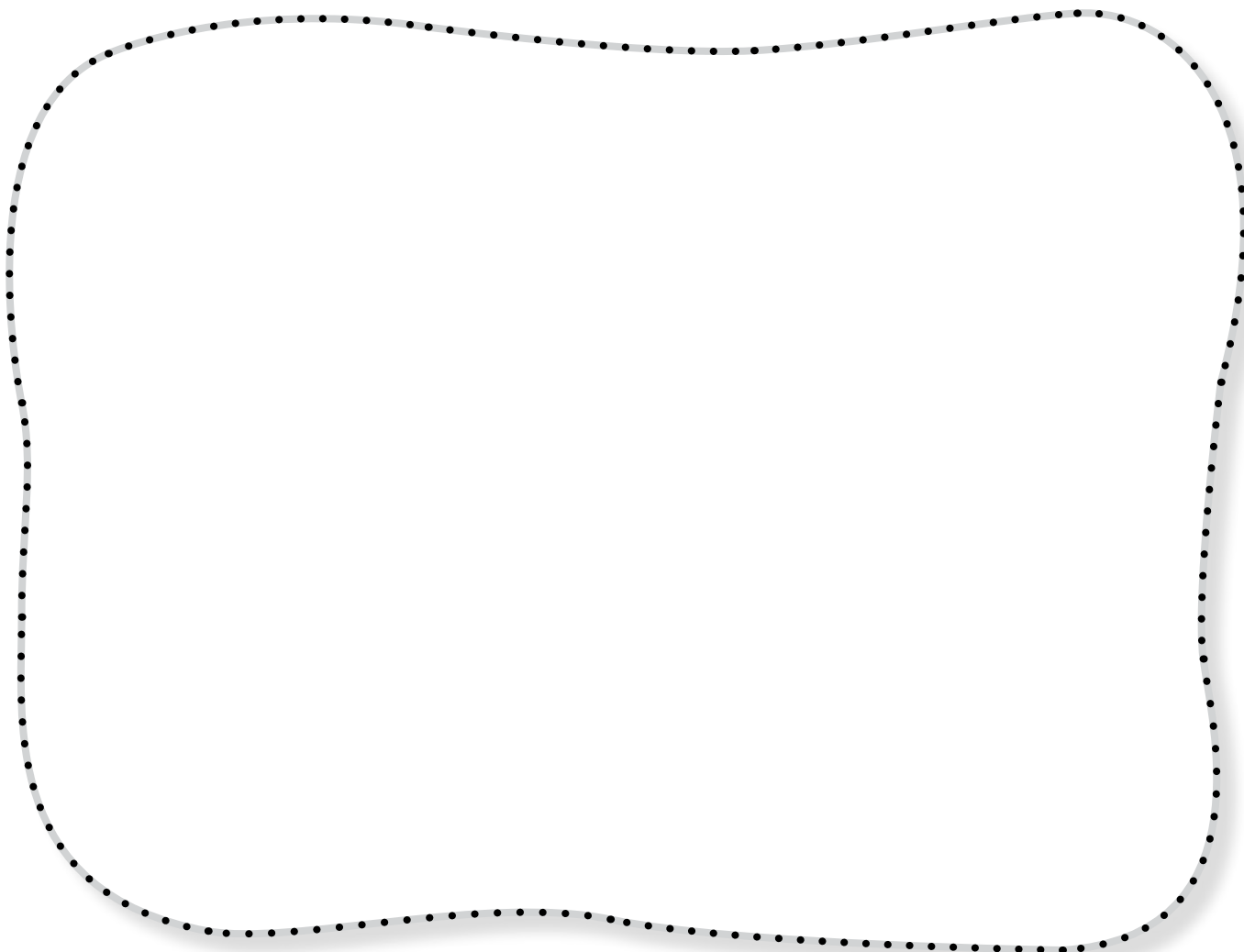|	
29	Decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
30	Correctly name two-dimensional shapes regardless of their orientations or overall size.
31	Analyze and compare two-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
32	Compose simple shapes to form larger shapes.
33	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
34	Correctly name three-dimensional shapes regardless of their orientations or overall size.
35	Analyze and compare three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
36	Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid"). Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

Name: _____

DIRECTIONS: Think about the problem.

> Sam and Nick have a basket. The basket has 3 apples. Are there enough apples for each boy to have one?

Draw a picture to show the problem.

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Solve It!

Name: _____

Read the problem. Solve the problem. Circle your answer.

Problem: Pat, Jan, and Meg have a bag. The bag has 2 balls. Are there enough balls for each girl to have one?

What Do You Know?

Draw the girls.

Draw the balls.
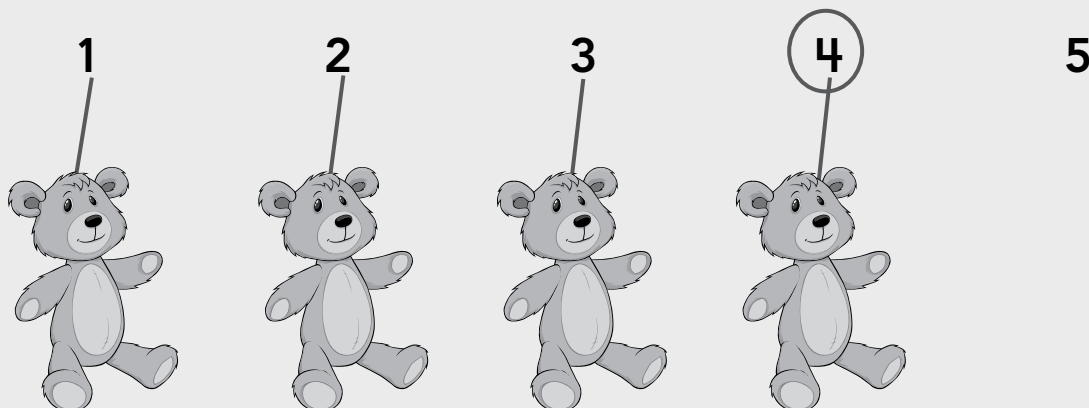
What Is Your Plan?

Count to find how many girls.

Count to find how many balls.

Solve the Problem!

Yes   **No**

Name: _____

DIRECTIONS: Look at the example. Draw lines to help you count. Circle your answers.

Example: How many bears are there?

1   2   3   ④   5

1. How many cats are there?

1   2   3   4   5

2. How many dogs are there?

1   2   3   4   5

Draw It!

Name: _____

DIRECTIONS: Draw a picture to show the problem. Circle your answer.

Juan has three dogs. He has three leashes. Will each dog have a leash?

Draw the dogs.

| 1 | 2 | 3 | 4 | 5 |

Draw the leashes.

| 1 | 2 | 3 | 4 | 5 |

Yes   No

Name: _____

DIRECTIONS: Read the problem. Solve the problem. Circle your answer.

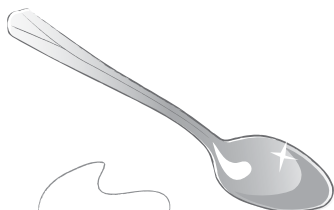Ty is serving tea. Each person needs a cup, a spoon, and a teabag.

cup

spoon

teabag

How many cups of tea can Ty make?

| 1 | 2 | 3 | 4 | 5 |

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