Hands-On Standards®, Common Core Edition

Grade 2

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hands-on learning for growing minds

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hand2mind 78866

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Blackline Masters

Introduction

How do we help children find meaning in mathematics? That is, how do we give children more than a rote script for reciting facts and churning out computations? How do we help children develop understanding?

Hands-On Standards®, Common Core Edition Grade 2 is an easy-to-use reference manual for teachers who want to help children discover meaning in mathematics. Each of the manual's 29 lessons demonstrates a hands-on exploration using manipulatives. The goal is to help children get a physical sense of a problem—to help children get their hands on the concepts they need to know and to help them "see" the meaning.

Each lesson in ***Hands-On Standards*** targets a clearly stated objective. The main part of a lesson offers a story problem that children can relate to and has the children work on the problem using a hands-on approach. Full-color photographs demonstrate the suggested steps. In addition to the main activity, each lesson includes suggested points of discussion, ideas for more exploration, a formative assessment item, and practice pages to help children solidify their understanding. The instructional model is a progression from concrete to abstract.

This book is divided into four sections—Operations and Algebraic Thinking, Number and Operations in Base Ten, Measurement and Data, and Geometry. These correspond to the four content domains for Grade 2 as cited in the ***Common Core State Standards for Mathematics***.

Each lesson in this book uses one or more of the following manipulatives:

Base Ten Blocks • 2-cm Color Cubes • Coin Tiles • Color Tiles • Cuisenaire® Rods • Geoboards • Geared Mini-Clock • Inchworms™ • Inchworms™ Ruler • Two-Color Counters

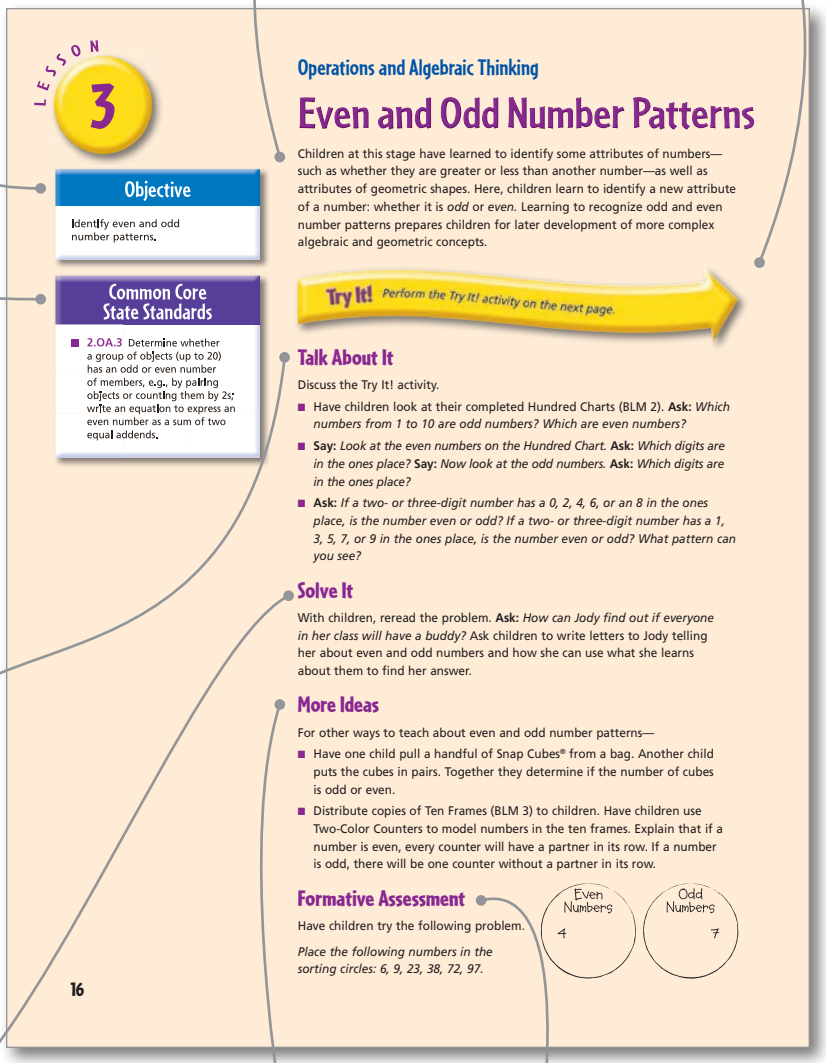
Read on to find out how ***Hands-On Standards, Common Core Edition Grade 2*** can help the children in your class find meaning in math and build a foundation for future math success!

A Walk Through a Lesson

Each lesson in ***Hands-On Standards*** includes many features, including background information, objectives, pacing and grouping suggestions, discussion questions, and ideas for further activities, all in addition to the step-by-step, hands-on activity instruction. Take a walk through a lesson to see an explanation of each feature.

Lesson Introduction
A brief introduction explores the background of the concepts and skills covered in each lesson. It shows how they fit into the larger context of children's mathematical development.

Try It! Arrow
In order to provide a transition from the introduction to the activity, an arrow draws attention to the Try It! activity on the next page. When the activity has been completed, return to the first page to complete the lesson.



LESSON 3

Operations and Algebraic Thinking

Even and Odd Number Patterns

Children at this stage have learned to identify some attributes of numbers—such as whether they are greater or less than another number—as well as attributes of geometric shapes. Here, children learn to identify a new attribute of a number: whether it is *odd* or *even*. Learning to recognize odd and even number patterns prepares children for later development of more complex algebraic and geometric concepts.

Objective

Identify even and odd number patterns.

Common Core State Standards

- 2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- Have children look at their completed Hundred Charts (BLM 2). **Ask:** *Which numbers from 1 to 10 are odd numbers? Which are even numbers?*
- **Say:** *Look at the even numbers on the Hundred Chart.* **Ask:** *Which digits are in the ones place?* **Say:** *Now look at the odd numbers.* **Ask:** *Which digits are in the ones place?*
- **Ask:** *If a two- or three-digit number has a 0, 2, 4, 6, or an 8 in the ones place, is the number even or odd? If a two- or three-digit number has a 1, 3, 5, 7, or 9 in the ones place, is the number even or odd? What pattern can you see?*

Solve It

With children, reread the problem. **Ask:** *How can Jody find out if everyone in her class will have a buddy?* Ask children to write letters to Jody telling her about even and odd numbers and how she can use what she learns about them to find her answer.

More Ideas

For other ways to teach about even and odd number patterns—

- Have one child pull a handful of Snap Cubes® from a bag. Another child puts the cubes in pairs. Together they determine if the number of cubes is odd or even.
- Distribute copies of Ten Frames (BLM 3) to children. Have children use Two-Color Counters to model numbers in the ten frames. Explain that if a number is even, every counter will have a partner in its row. If a number is odd, there will be one counter without a partner in its row.

Formative Assessment

Have children try the following problem.

Place the following numbers in the sorting circles: 6, 9, 23, 38, 72, 97.

Even Numbers: 4

Odd Numbers: 7

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Objective
The **Objective** summarizes the skill or concept children will learn through the hands-on lesson.

Common Core State Standards
Each lesson has been created to align with one or more of the **Common Core State Standards for Mathematics**.

Talk About It
The **Talk About It** section provides post-activity discussion topics and questions. Discussion reinforces activity concepts and provides the opportunity to make sure children have learned and understood the concepts and skills.

Solve It
Solve It gives students a chance to show what they've learned. Children are asked to return to and solve the original word problem. They might summarize the lesson concept through drawing or writing, or extend the skill through a new variation on the problem.

More Ideas
More Ideas provides additional activities and suggestions for teaching about the lesson concept using a variety of manipulatives. These ideas might be suggestions for additional practice with the skill or an extension of the lesson.

Formative Assessment
Formative assessments allow for on-going feedback on children's understanding of the concept.

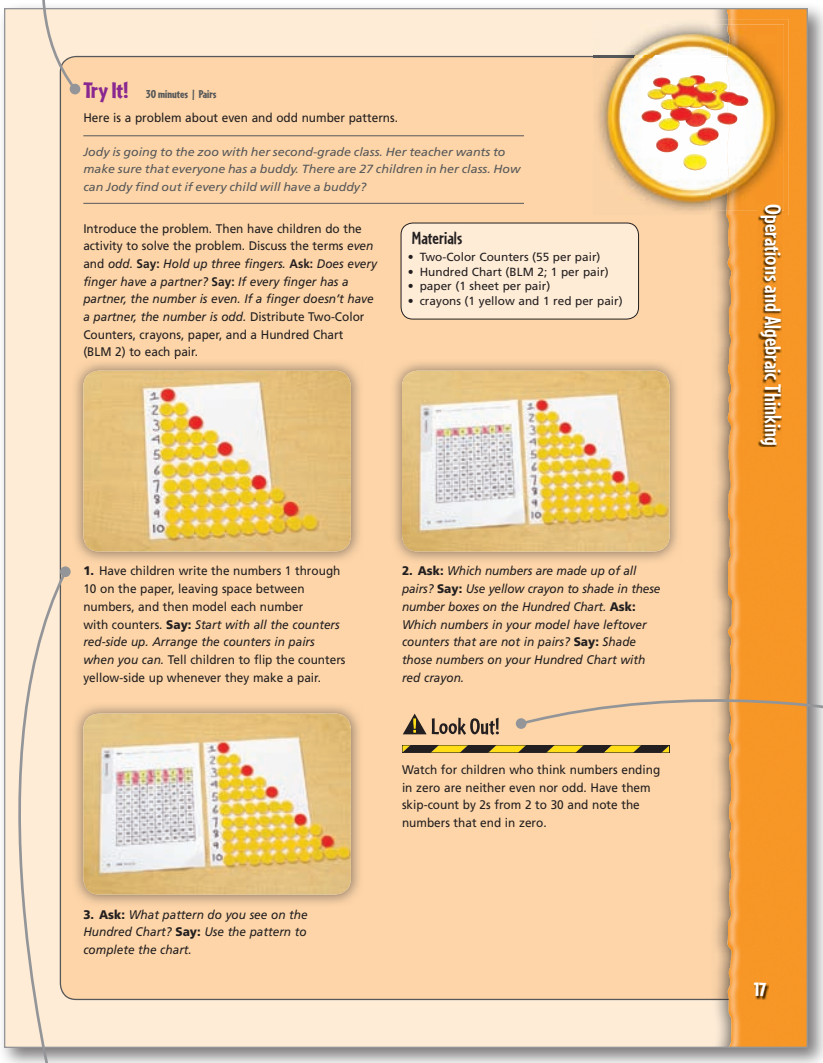
Try It!

The **Try It!** activity opens with **Pacing** and **Grouping** guides. The **Pacing** guide indicates about how much time it will take for children to complete the activity, including the post-activity discussion. The **Grouping** guide recommends whether children should work independently, in pairs, or in small groups.

Next, the **Try It!** activity is introduced with a real-world story problem. Children will "solve" the problem by performing the hands-on activity. The word problem provides a context for the hands-on work and the lesson skill.

The **Materials** box lists the type and quantity of materials that children will use to complete the activity, including manipulatives such as Color Tiles and Base Ten Blocks.

This section of the page also includes any instruction that children may benefit from before starting the activity, such as a review of foundational mathematical concepts or an introduction to new ones.



Try It! 30 minutes | Pairs

Here is a problem about even and odd number patterns.

Jody is going to the zoo with her second-grade class. Her teacher wants to make sure that everyone has a buddy. There are 27 children in her class. How can Jody find out if every child will have a buddy?

Introduce the problem. Then have children do the activity to solve the problem. Discuss the terms *even* and *odd*. **Say:** *Hold up three fingers.* **Ask:** *Does every finger have a partner?* **Say:** *If every finger has a partner, the number is even. If a finger doesn't have a partner, the number is odd.* Distribute Two-Color Counters, crayons, paper, and a Hundred Chart (BLM 2) to each pair.

Materials
- Two-Color Counters (55 per pair)
- Hundred Chart (BLM 2; 1 per pair)
- paper (1 sheet per pair)
- crayons (1 yellow and 1 red per pair)

1. Have children write the numbers 1 through 10 on the paper, leaving space between numbers, and then model each number with counters. **Say:** *Start with all the counters red-side up. Arrange the counters in pairs when you can.* Tell children to flip the counters yellow-side up whenever they make a pair.

2. Ask: *Which numbers are made up of all pairs?* **Say:** *Use yellow crayon to shade in these number boxes on the Hundred Chart.* **Ask:** *Which numbers in your model have leftover counters that are not in pairs?* **Say:** *Shade those numbers on your Hundred Chart with red crayon.*

3. Ask: *What pattern do you see on the Hundred Chart?* **Say:** *Use the pattern to complete the chart.*

⚠ Look Out!

Watch for children who think numbers ending in zero are neither even nor odd. Have them skip-count by 2s from 2 to 30 and note the numbers that end in zero.

Operations and Algebraic Thinking

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Look Out!

Look Out! describes common errors or misconceptions likely to be exhibited by children at this age dealing with each skill or concept and offers troubleshooting suggestions.

Step-by-Step Activity Procedure

The hands-on activity itself is the core of each lesson. It is presented in three—or sometimes four—steps, each of which includes instruction in how children should use manipulatives and other materials to address the introductory word problem and master the lesson's skill or concept. An accompanying photograph illustrates each step.

A Walk Through a Student Page

Each lesson is followed by a corresponding set of student pages. These pages take the child from the concrete to the abstract, completing the instructional cycle. Children begin by using manipulatives, move to creating visual representations, and then complete the cycle by working with abstract mathematical symbols.

Exercise
Concrete and **Representational** exercises (pictorial representations of the featured manipulative) help children bridge conceptual learning to symbolic mathematics.

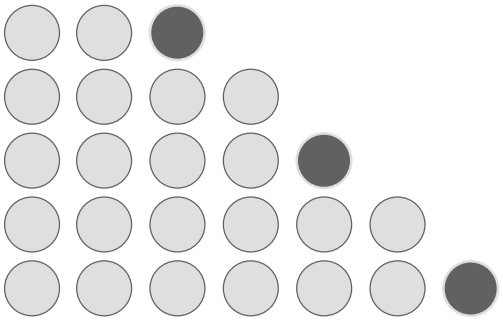
Standards-Based Math Practice
Abstract exercises provide standards-based math practice to allow children to deepen their understanding of the featured skill.

Lesson 3 Operations and Algebraic Thinking

Answer Key

Use Two-Color Counters. Build each number in the rows. Write the number. Circle all odd numbers. (Check students' work.)

1.



3; 4; 5; 6; 7; 3, 5, and 7 should be circled.

Use Two-Color Counters. Build each number. Circle the number if it is odd.

2. 11

Check students' models; number should be circled.

3. 14

Check students' models; number should not be circled

For each number, write odd or even.

4. 2 even **5.** 5 odd **6.** 19 odd

7. 20 even **8.** 1 odd **9.** 13 odd

Download student pages at hand2mind.com/hosstudent.

Extended Response
Extended Response exercises feature an open-ended constructed response question to help teachers gauge children's understanding.

Answer Key

Challenge! What digits can be in the ones place for a number to be even?

Challenge: 0, 2, 4, 6, and 8

Answers for the Teacher
Answers are provided for teachers on the included student pages.

Student Pages Download
Download clean copies of the student pages by visiting the URL listed.