



San Diego Unified School District

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Instructional Module to Enhance the Teaching of

HARCOURT

**Math**

California Edition

**Grade 1**

**Module 11– Revised**

*Fractions*

-WORK IN PROGRESS -

Revised 5/3/04

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San Diego City Schools  
Instruction and Curriculum Division  
MATHEMATICS CURRICULUM MAPS – GRADE 1

**MODULE 11 – FRACTIONS**

**Modules represent individual units of study that lead to essential learnings**

**THREADS THROUGHOUT THE YEAR:**

*The threads represent ongoing learning opportunities in which students should be actively engaged throughout all units of inquiry during the entire school year. These items should not be isolated to any one particular unit of inquiry.*  
Students will be provided opportunities to:

- Develop understanding of numbers and the number system and use their understanding to solve problems and recognize reasonable results.
- Use mathematical reasoning to solve problems.
- Develop understanding of and fluency in basic computation and procedural skills.
- Use equations and to express generalizations of patterns and relationships.
- Communicate their mathematical thinking by using words, numbers, symbols, graphs and charts, and describe different representations
- Express generalizations of patterns and relationships.
- Make connections among mathematical ideas and between other disciplines.
- Develop and use strategies, skills, and concepts to solve problems.
- Use appropriate tools, including technology as vehicles to learn mathematical concepts.

*These are essential learnings that represent bigger ideas/concepts:*

- Students recognize that fractional parts are equal shares or equal-sized portions of a whole thing or a whole set.
- Students recognize and differentiate between  $\frac{1}{2}$ ,  $\frac{1}{4}$ , and  $\frac{1}{3}$ .

*These are essential questions that learners ask themselves in order to achieve the essential learnings:*

- How do I know that when parts of a whole (or set) are divided they are equal or fair?
- How do I use the vocabulary of fractions (i.e., one-half, one-third, one-fourth) to describe parts of a whole or parts of a set?
- How do I recognize and differentiate between  $\frac{1}{2}$ ,  $\frac{1}{3}$ , and  $\frac{1}{4}$ ?

**Resources: Van de Walle, Chapter 15, pp. 242-244**

## Fractions 5 Days

### Key Mathematical Concepts:

- Identify halves and  $\frac{1}{2}$  of wholes
- Identify fourths and  $\frac{1}{4}$  of wholes
- Identify thirds and  $\frac{1}{3}$  of wholes
- Identify  $\frac{1}{2}$ ,  $\frac{1}{3}$ , and  $\frac{1}{4}$  of a group
- Use appropriate problem – solving strategies

### Big Ideas:

- Fractional parts are equal shares or equal-sized portions of a whole thing or a whole set.
- Fractional parts have special names that tell how many parts of that size are needed to make a whole. For example, *thirds* require three parts to make a whole.
- The more parts required to make a whole, the smaller the parts.
- The numerator of a fraction tells how many parts are being considered. The denominator indicates the kind or size of parts the numerator counts.
- **For any particular fractional part, children need to reflect on two aspects or components:**
  1. **The whole must be made up of the *correct number* of parts or shares.**
  2. **Each of the parts must be *equal or fair shares*; they must be the same size.**

**(Most of the *Big Ideas* stated above will likely not be internalized by first graders by the end of this Module. Students need many more subsequent opportunities to fully develop these understandings.)**

### Chapter 25: Fractions

#### DAY

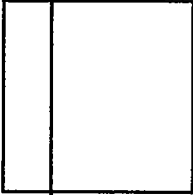
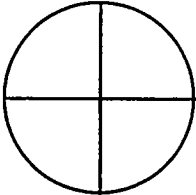
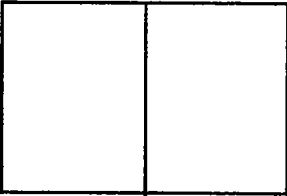
1. 25.1 Halves
2. 25.2 Fourths
3. 25.3 Thirds
4. 25.4 Problem Solving: Choose the Model
5. 25.5 Parts of Groups

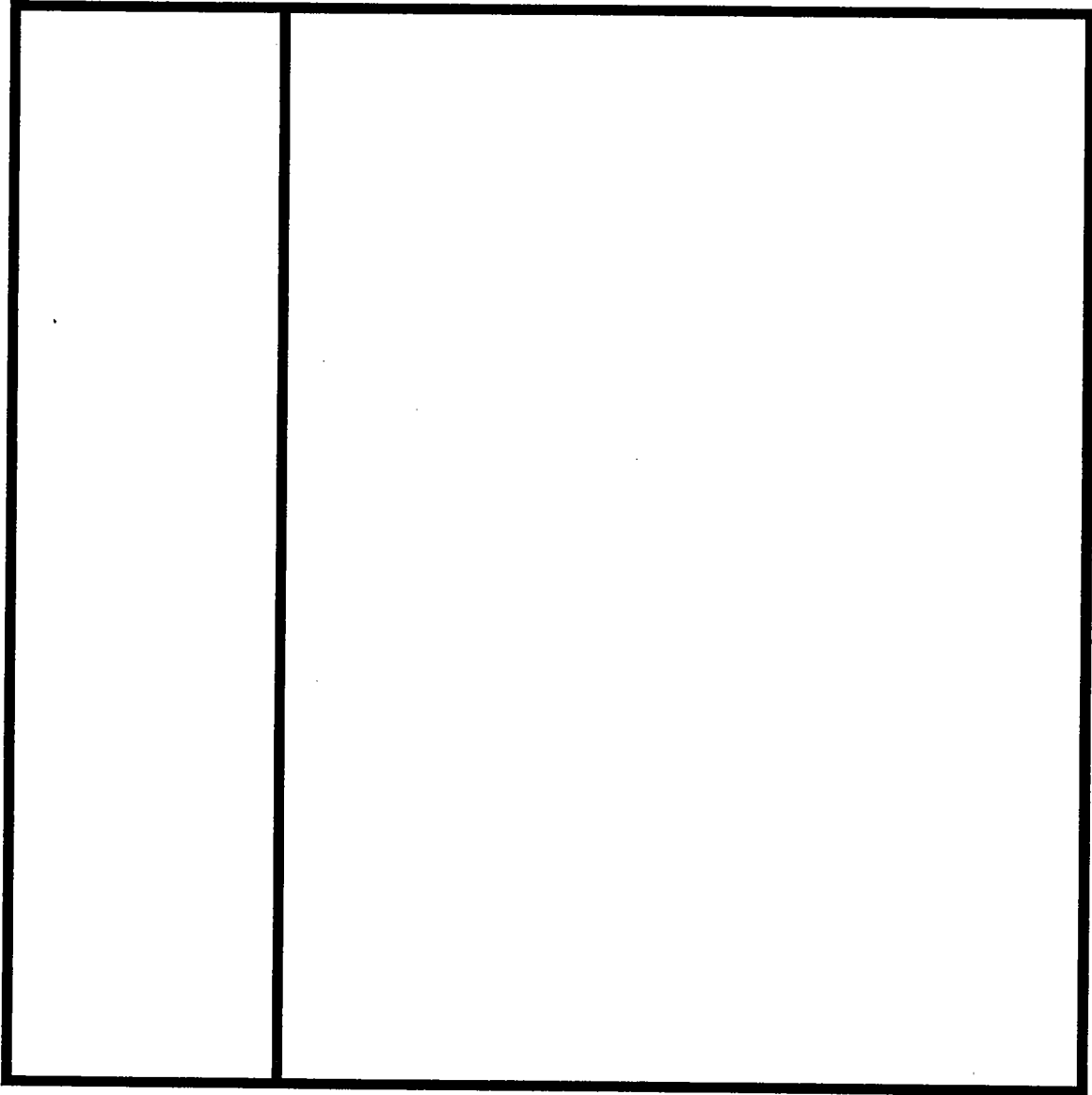
<b>Day 1</b> Lesson 25.1	<b>Day 2</b> Lesson 25.2	<b>Day 3</b> Lesson 25.3	<b>Day 4</b> Lesson 25.4	<b>Day 5</b> Lesson 25.5
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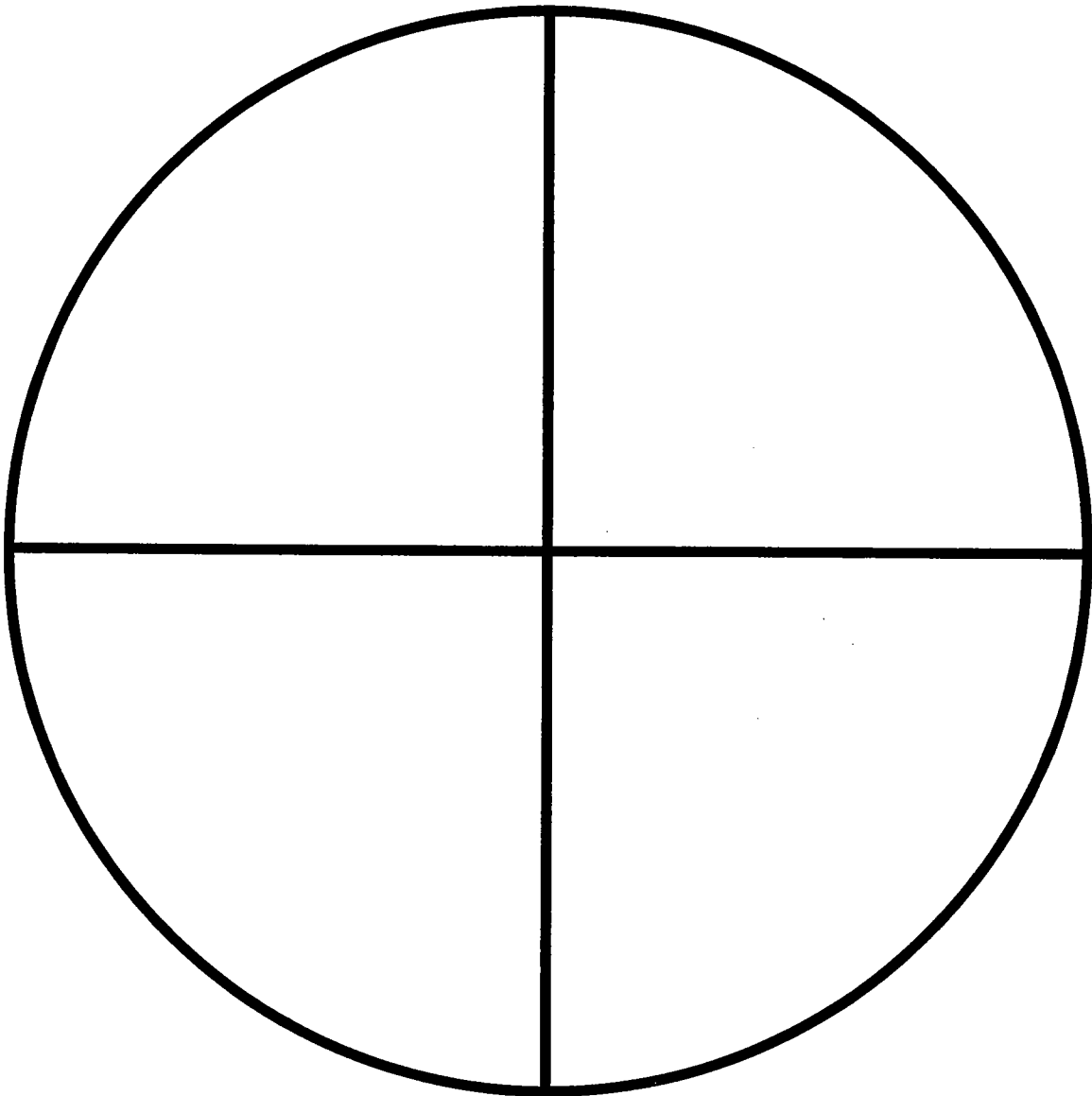
DAY 1  
Fractions  
Chapter 25: Fractions  
LESSON 25.1 TE P. 353A

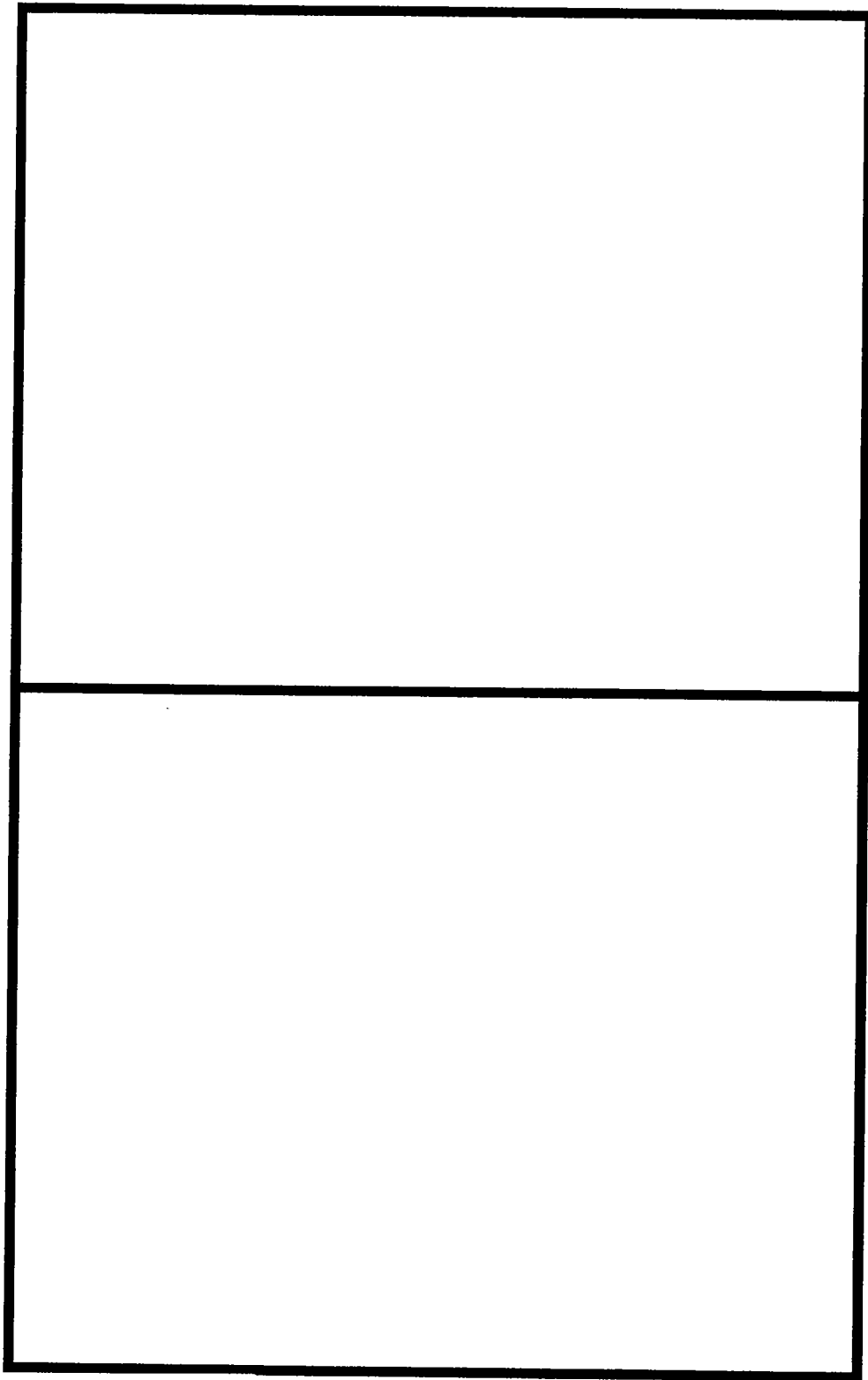
<b>LESSON FOCUS:</b>	Halves
<b>CALIFORNIA STANDARD:</b>	<b>Mathematical Reasoning</b> 1.2: Use tools, such as manipulatives or sketches, to model problems.
<b>PURPOSE OF LESSON:</b>	To identify halves and $\frac{1}{2}$ of wholes.
<b>ROUTINE:</b> <i>TE and WB P.351</i>  <i>TE P. 354, Read-Aloud Anthology, P. AN3</i>	Suggestion: <b>Introducing the Chapter:</b> TE and Workbook P. 351 Or <b>Literature Connection – “I’ll Share”:</b> TE P. 354 (bottom margin)
<b>LAUNCH:</b> <i>Materials:</i> 8 each of 9x9” squares 9x24” rectangles 9” diameter circles <u>in white construction paper</u>  8 each of 9x9” squares 9x24” rectangles 9” diameter circles <u>in red construction paper</u>  <i>(Colors are arbitrary, choose what you like, but use colors light enough for students to write on them with pencil.)</i>  <i>For each student, scissors, pencil.</i>	<b>Introduce Activity: Fraction Cake</b> <ul style="list-style-type: none"> <li>• Explain to students that we will spend this week in math making a “Fraction Cake” to help us learn and write about fractions.</li> <li>• First students must decide what shape their cake will be, a square cake, a circle cake, or a rectangle cake. (<b>Note:</b> you may decide that all students will use a square or rectangle cake since it is often quite difficult for students to draw circles and then effectively show equal shares</li> <li>• Show each of these choices using models you have created out of white construction paper.</li> <li>• The white piece of construction paper becomes the first layer of their cake. Explain that this is one-whole layer.</li> <li>• Have students write “one-whole” on this layer.</li> <li>• Next, give students a “red” layer (pre-cut in their shape). Ask students to lay this on top of their white layer.</li> <li>• Explain that we need to cut the second layer in half.</li> </ul> <p><b>Note:</b> “A first goal in the development of fractions is to help children construct the idea of <i>fractional parts of the whole</i> – the parts that result when the whole has been partitioned into <i>equal sized portions or fair shares</i>. The one idea that young children do bring to the concept of fractions is the notion of partitioning or sharing. Children seem to understand the idea of separating a quantity into two or more parts to be shared among friends. This understood concept of sharing is therefore a good place to begin the discussion of fractional parts.” (Van de Walle, <i>Elementary and Middle School Mathematics</i>, Pg. 211)</p>

	<ul style="list-style-type: none"> <li>• Reinforce the importance of creating equal shares. Suggest that they have to share this layer equally with another person so each partner has a “fair share”; how would they divide it fairly? Brainstorm ways to divide paper into two fair shares.</li> <li>• Students cut “red” layer into two equal shares.</li> <li>• Students must understand that the area of each share must be equal (fair-share). To approach this understanding, after students cut their papers, ask:             <ul style="list-style-type: none"> <li>– <i>How can you prove that you cut your paper into two fair shares?</i></li> </ul> </li> <li>▪ To understand the language, representation and meaning of “one-half,” lead the following discussion:             <ul style="list-style-type: none"> <li>– <i>How many parts do you have in the “red” layer? (2)</i></li> <li>– <i>If I hold one fair-share in the air, it is one of how many parts? (2)</i></li> <li>– <i>A way of saying one of two fair shares is “one-half.”</i></li> </ul> </li> <li>• Write the words “one-half” on the board.</li> <li>• Another way we represent one-half is with symbols. It is written: <math>\frac{1}{2}</math>.</li> <li>• Explain to students that this is how we write “1 of 2” fair shares.</li> <li>• Ask students to write <math>\frac{1}{2}</math> on one of their halves. Explain that “one of two” is the same thing as “one-half.”</li> <li>• Hold up the other piece, repeat the procedure.</li> <li>• Discuss how this works with all three of the shapes students are working with (square, circle and rectangle).</li> <li>• [ <b>Note:</b> It is quite natural for student to understand one of the representation of a fraction and not the other. Make sure to call out the connections between the model, symbolic, and spoken forms.]</li> </ul>
<p><b>EXPLORE:</b></p> <p>Plain paper Crayons</p>	<ul style="list-style-type: none"> <li>• Students draw figures that show wholes and halves. Students color half the figure. Students label their figures “one-half” or <math>\frac{1}{2}</math>.</li> <li>• As you confer, be sure to ask students how they know that they have colored in one-half (there are two parts and they are fair shares).</li> </ul>
<p><b>PRACTICE:</b> TE and WB Pp. 353-354</p>	<p>As time allows, TE and Workbook Pp. 353-354. As you confer, be sure to ask students how they know that they have circled or colored in one-half (<i>there are two parts and they are fair shares</i>).</p>

<p><b>SUMMARIZE:</b></p> <p>Fraction cards, Module Pp. 277-281</p>	<p><b>Discuss:</b></p> <ul style="list-style-type: none"> <li>Some of the figures below are divided into halves, and some are not. Analyze each figure with the students:</li> </ul> <div style="text-align: center;">  </div> <p>The whole is broken into two parts. Is this one-half? Why not?  <i>(The parts are not fair shares.)</i></p> <div style="text-align: center;">  </div> <p>The whole is broken into fair shares. Is this one-half? Why not?  <i>(To have halves, you need two parts making up the whole.)</i></p> <div style="text-align: center;">  </div> <p>Is this figure broken into halves? How do you know?  <i>(There are two parts and they are fair shares.)</i></p>
<p><b>HOMEWORK:</b></p>	<p><b>Suggestion:</b>  <i>Family Involvement Activities Pp. FA109 and FA112</i></p>

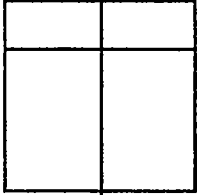
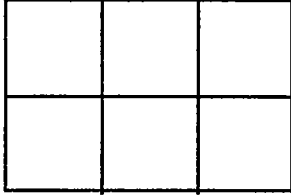
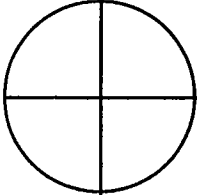


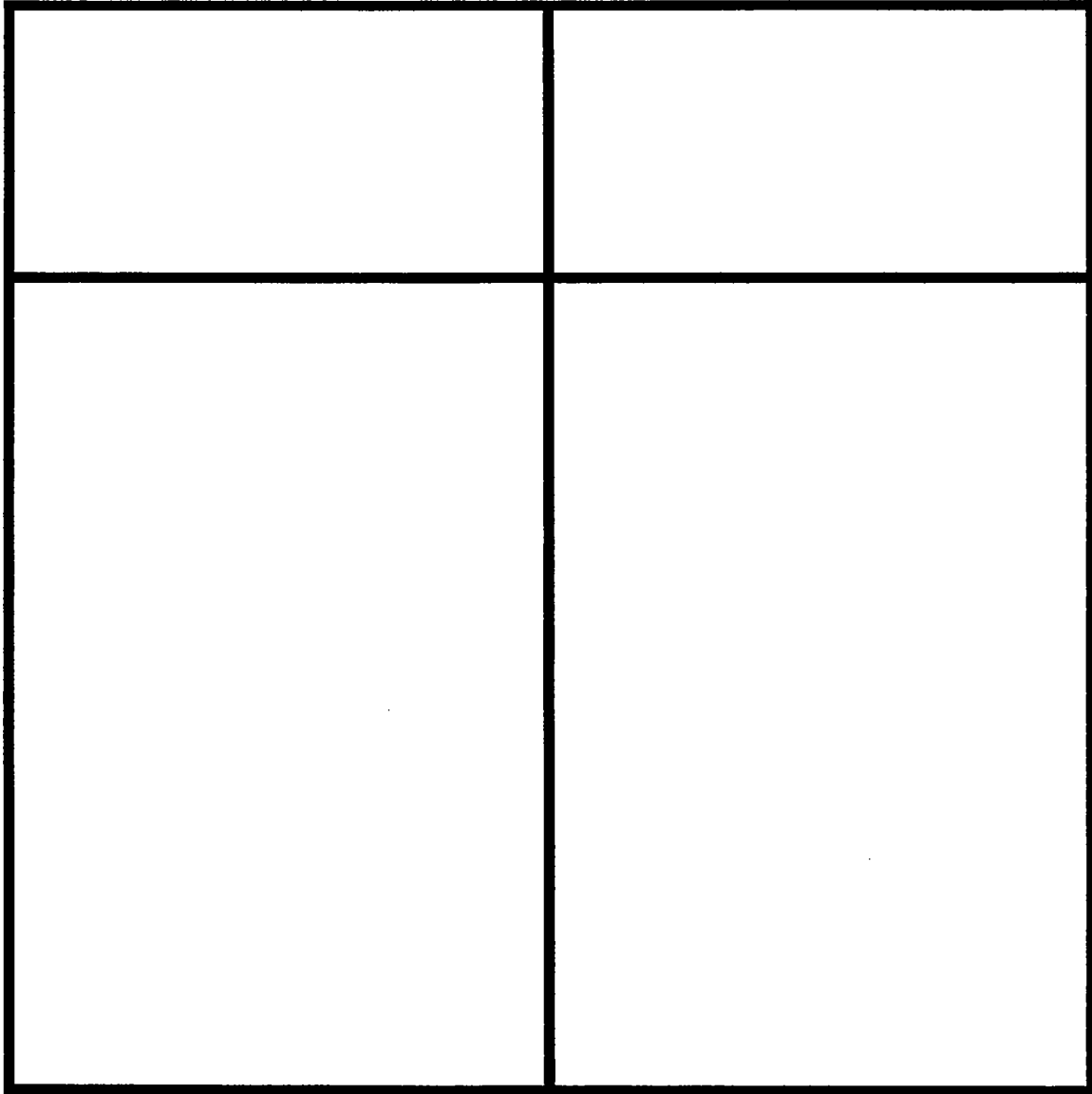


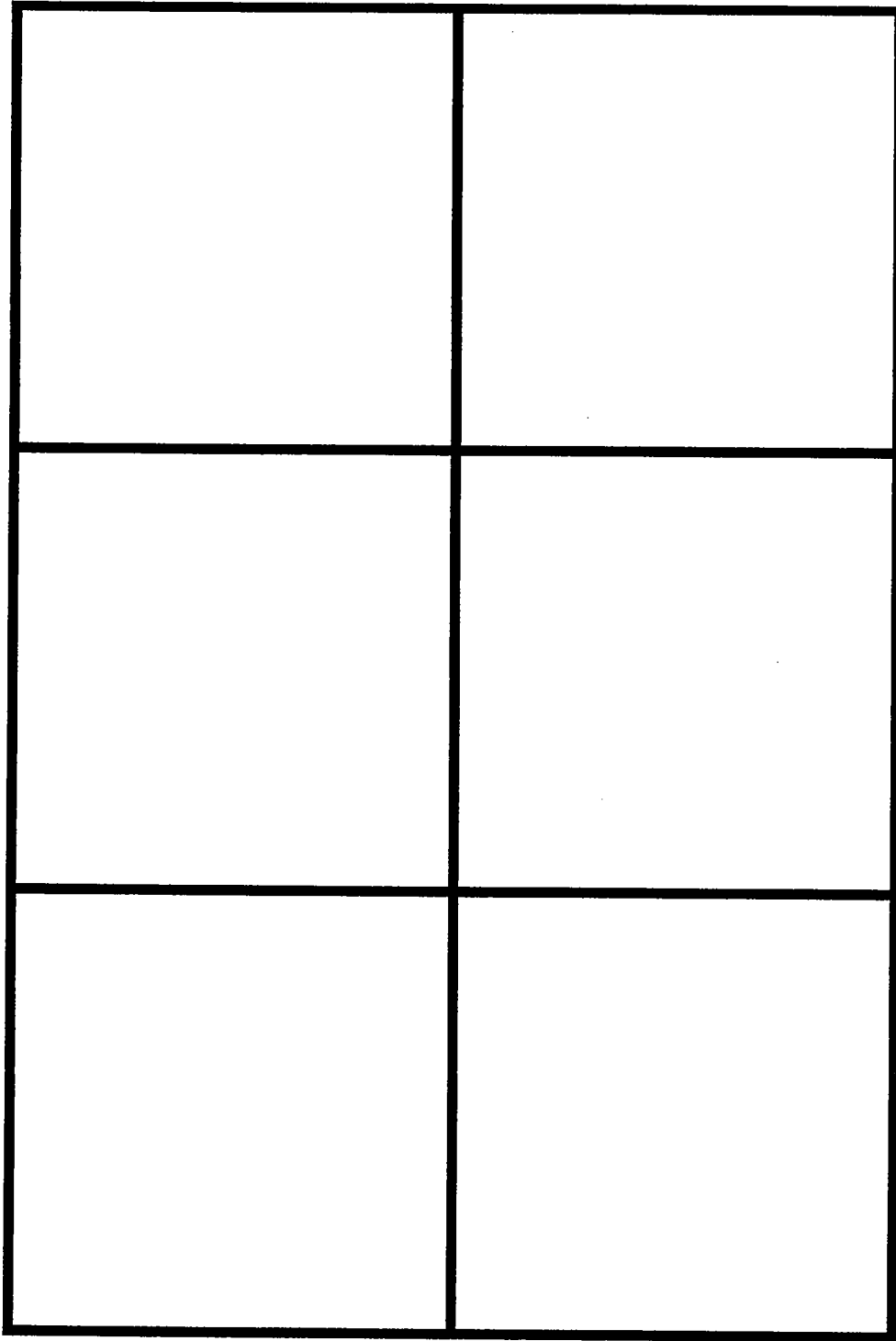


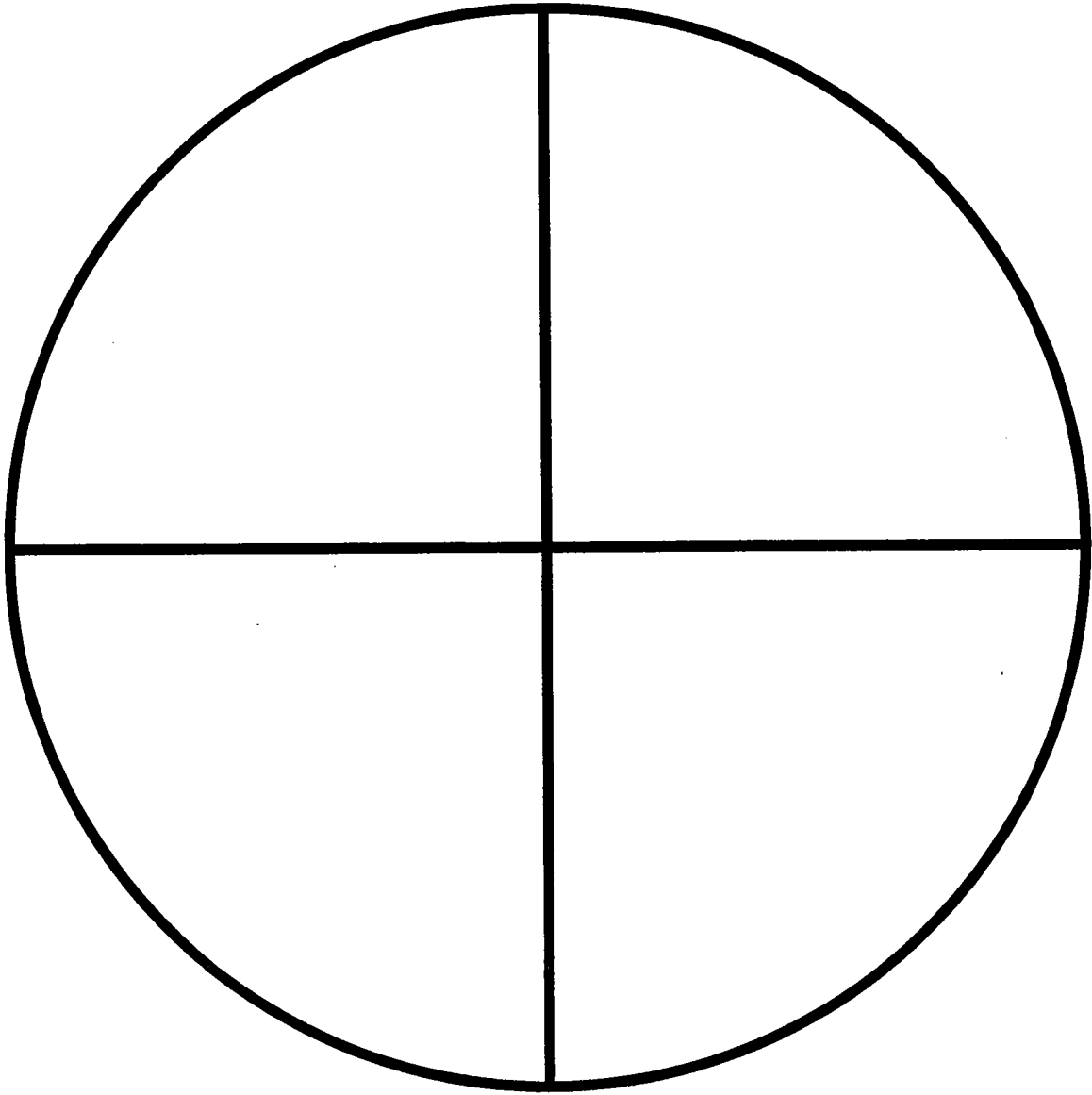
**DAY 2**  
**Fractions**  
**Chapter 25: Fractions**  
**LESSON 25.2 TE P. 355A**

<b>LESSON FOCUS:</b>	<b>Fourths</b>
<b>CALIFORNIA STANDARD:</b>	<b>Mathematical Reasoning</b> 1.2: Use tools, such as manipulatives or sketches, to model problems.
<b>PURPOSE OF LESSON:</b>	To identify fourths and $\frac{1}{4}$ of wholes
<b>ROUTINE:</b> TE P. 355A  TE P. 355	Suggestion: <b>Problem of the Day:</b> TE P. 355A Or <b>Quick Review:</b> TE P. 355
<b>LAUNCH:</b>  8 each of 9x9" squares 9x24" rectangles 9" diameter circles <u>in green construction paper</u> *. For each student, scissors, pencil.  <u>*Colors are arbitrary.</u> The color should not be the same as Day 1.	<b>Introduce Activity: Fraction Cake</b> <ul style="list-style-type: none"> <li>• Explain to students that today we will add another layer to our cake.</li> <li>• Give students a "green" layer (pre-cut in their shape). Ask students to lay this on top of their white layer. Explain that we need to cut the "green" layer into four "fair shares."</li> <li>• Reinforce the importance of creating equal shares (fair shares). Suggest that they have to share this layer equally with three other people so each person has a "fair share." How would they divide it fairly?</li> <li>• Brainstorm strategies for dividing the paper equally into the four fair shares.</li> <li>• Students cut the layer into four fair shares.</li> <li>• How can you prove that you cut your paper into four fair shares?</li> </ul> <p>To understand the language, representation and meaning of "one-fourth," lead the following discussion:</p> <ul style="list-style-type: none"> <li>• How many parts do you have in the "green" layer (4)</li> <li>• If I hold one fair-share in the air, it is one of how many parts? (4)</li> <li>• A way of saying one of four fair shares is "one-fourth."</li> <li>• Write the words "one-fourth" on the board.</li> <li>• Another way we represent one-fourth is with symbols. It is written: <math>\frac{1}{4}</math>.</li> <li>• Explain to students that this is how we write 1 of 4 fair shares.</li> <li>• If students are using different shape pieces, be sure to have a conversation relating to the fact that the shape of the piece does not make a difference. The important idea is 1 of 4 fair shares.</li> <li>• Ask students to write <math>\frac{1}{4}</math> on one of their fourths.</li> <li>• Repeat the process for each of the pieces. Student will</li> </ul>

	<p>ultimately have written <math>\frac{1}{4}</math> on each of their pieces.</p>
<p><b>EXPLORE:</b>  Plain paper Crayons</p>	<p>Students draw figures that show wholes and fourths. Students color one-fourth the figure. Students label their figures "one-fourth" or <math>\frac{1}{4}</math>.</p> <p>As you confer, be sure to ask students how they know that they have colored in one-fourth (<i>there are four parts and they are fair shares</i>).</p>
<p><b>PRACTICE:</b> TE and WB Pp. 353-354</p>	<p><b>As time allows, TE and Workbook pp.355-356</b></p> <p>As you monitor students as they complete the task, be sure to ask them how they know that they have circled or colored in the correct fraction (<i>there are two/four parts and they are fair shares</i>).</p>
<p><b>SUMMARIZE:</b>  Fraction cards, Module Pp. 285-289</p>	<p><b>Discuss:</b> Some of the figures below are divided into fourths, and some are not. Analyze each figure with the students:</p> <div style="text-align: center;">  </div> <p>The whole is broken into four parts. Is each share one-fourth? Why not? <i>The parts are not fair shares.</i></p> <div style="text-align: center;">  </div> <p>The whole is broken into fair shares. Is each share one-fourth? Why not? <i>To have fourths, you need four parts making up the whole.</i></p> <div style="text-align: center;">  </div> <p>Is this figure broken into fourths? How do you know? <i>There are four parts and they are fair shares.</i></p>
<p><b>HOMEWORK:</b></p>	<p><b>Suggestion:</b> Problem Solving 25.2 (bottom margin TE P.356)</p>

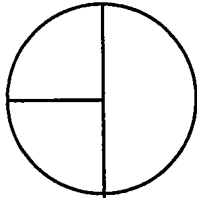
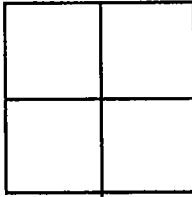


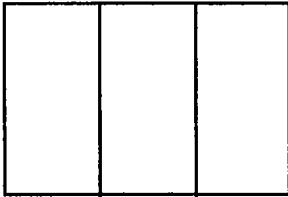


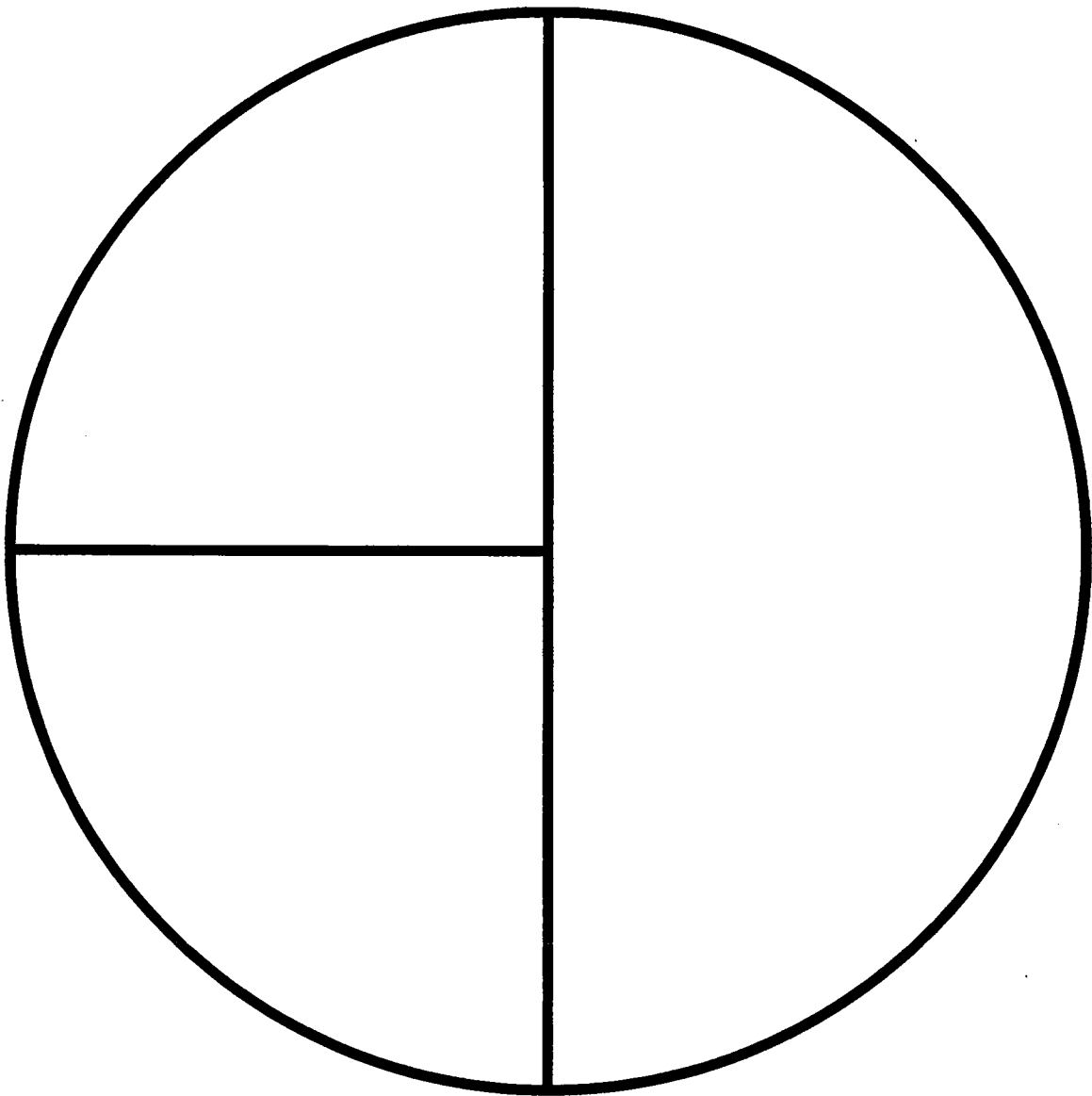


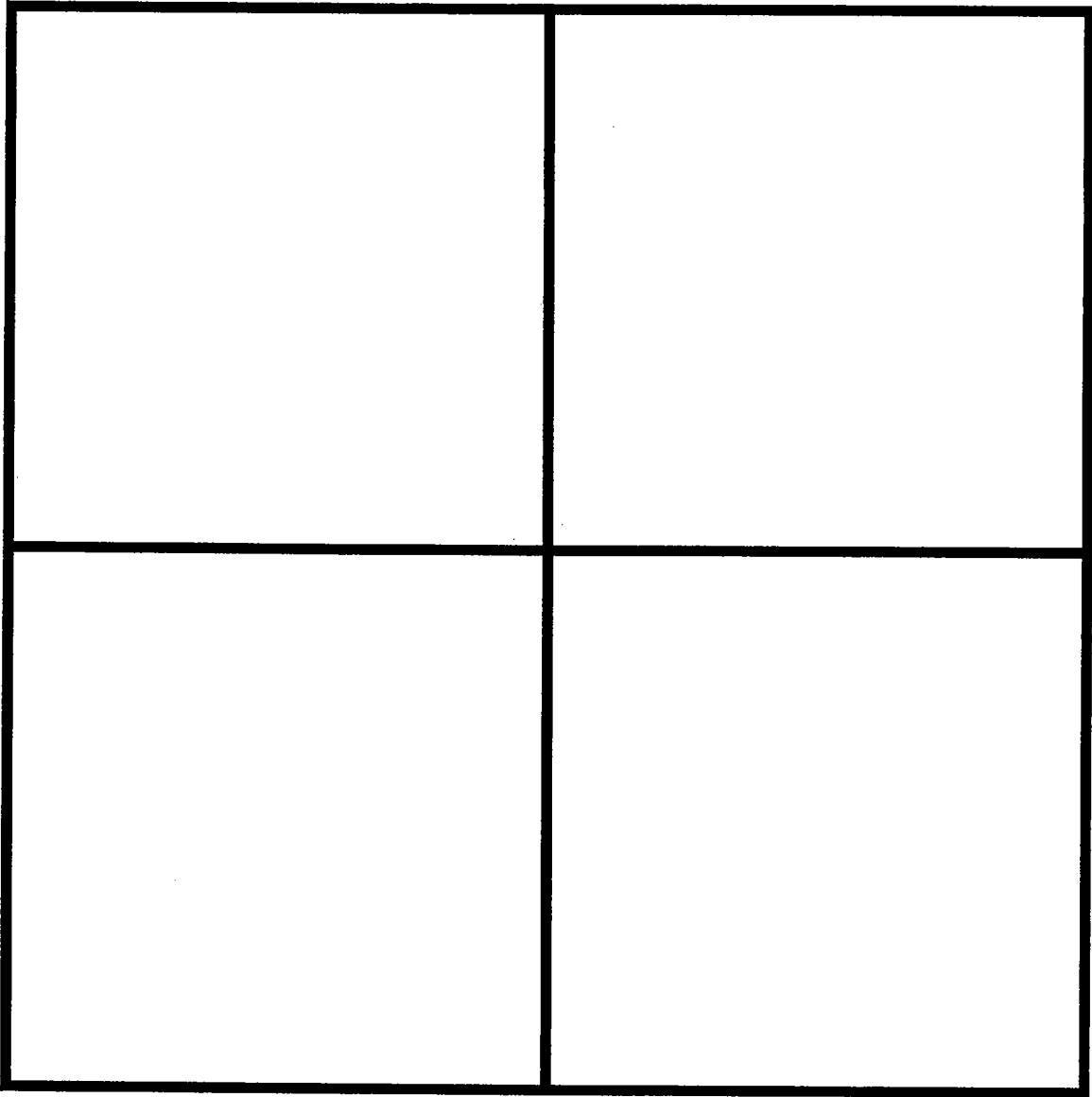
**DAY 3**  
**Fractions**  
**Chapter 25: Fractions**  
**LESSON 25.3 TE P. 357A**

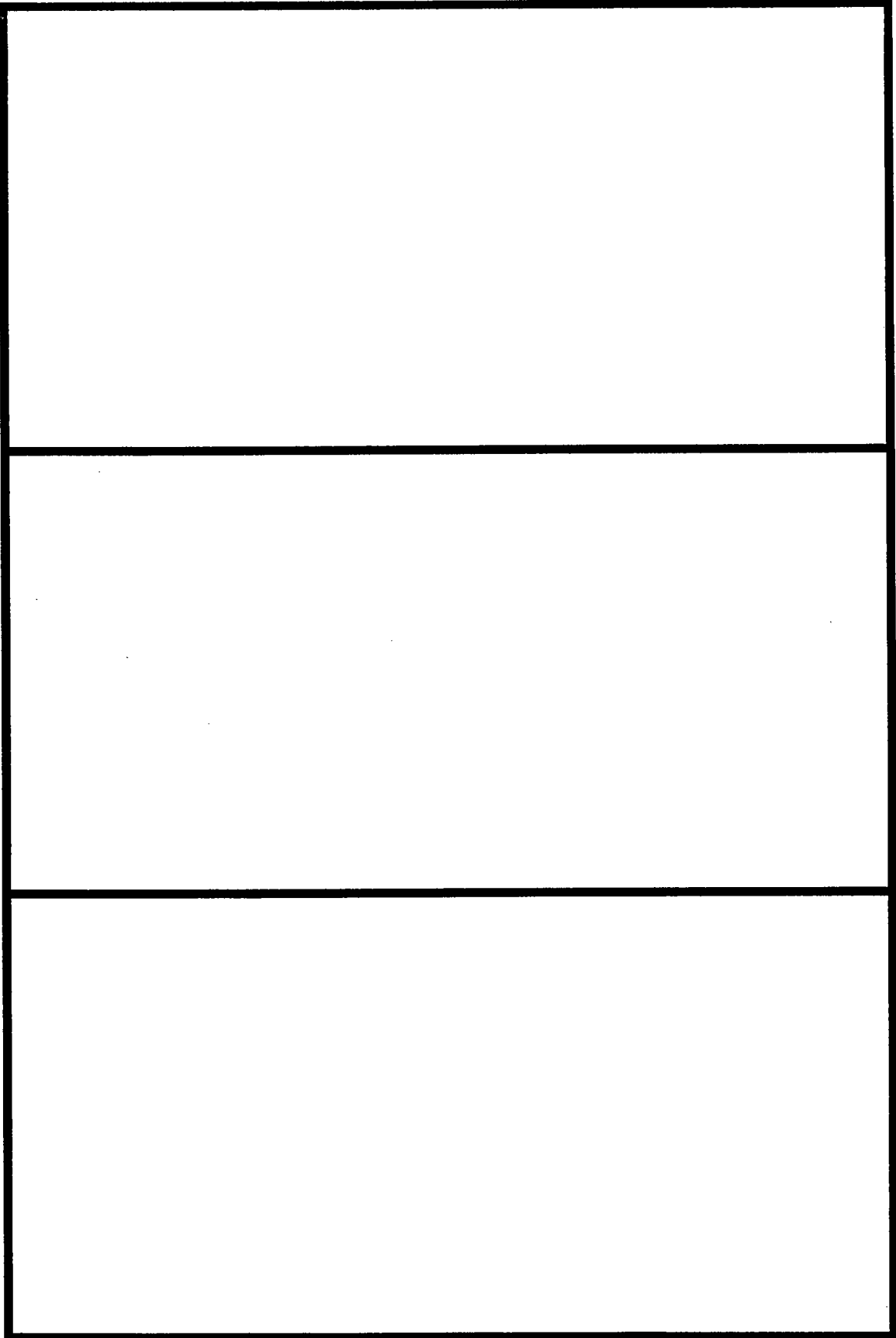
<b>LESSON FOCUS:</b>	<b>Thirds</b>
<b>CALIFORNIA STANDARD:</b>	<b>Mathematical Reasoning</b> <b>1.2:</b> Use tools, such as manipulatives or sketches, to model problems.
<b>PURPOSE OF LESSON:</b>	To identify thirds and $\frac{1}{3}$ of wholes
<b>ROUTINE:</b> <i>TE P. 355A</i>  <i>TE P. 355</i>	Suggestion: <b>Problem of the Day:</b> <i>When you get home from school, there is a delicious chocolate cake waiting for you. Your mom asks, "Would you like <math>\frac{1}{4}</math> of the cake or <math>\frac{1}{2}</math> of the cake?" You are so hungry; you want the biggest piece. Do you want <math>\frac{1}{4}</math> of the cake or <math>\frac{1}{2}</math> of the cake?</i>  <i>Why do you think that is the biggest portion?</i> <i>How could you prove it?</i>
<b>LAUNCH:</b>  <i>8 each of</i> <i>9x9" squares</i> <i>9x24" rectangles</i> <i>9" diameter circles</i> <i>in blue construction paper*.</i> <i>For each student,</i> <i>scissors, pencil.</i>  <i>*Color is arbitrary.</i> <i>It should not be the same colors as day 1 or day 2</i>  <i>String for circles</i>	<b>Introduce Activity: Fraction Cake</b> <ul style="list-style-type: none"><li>• Explain to students that today we will add another layer to our cake.</li><li>• Give students a "blue" layer (pre-cut in their shape). Ask students to lay this on top of their white layer. Explain that we need to cut the "blue" layer into three "fair shares."</li><li>• Reinforce the importance of creating equal shares (fair shares). Suggest that they have to share this layer equally with two other people so each person has a "fair share." How would they divide it fairly?</li><li>• Brainstorm strategies for dividing the paper equally into the three fair shares.</li><li>• Circles will be the most difficult to divide equally into three fair shares. One way is to tie the end of a piece of string to the center of another piece of string, creating a Y. Students then can place the intersection of the Y in the center of their circle and maneuver the lines until they see 3 equal pie shapes.</li><li>• Thirds are not easy. You may decide that you want a "template" for the children to trace for each of their shapes.</li><li>• Students cut the layer into three fair shares.</li><li>• <i>How can you prove that you cut your paper in three fair shares?</i></li></ul> <p>To understand the language, representation and meaning of "one-third," lead the following discussion:</p> <ul style="list-style-type: none"><li>• How many parts do you have in the "blue" layer (3)</li><li>• If I hold one fair-share in the air, it is one of how many parts?</li></ul>

	<p>(3)</p> <ul style="list-style-type: none"> <li>• A way of saying one of three fair shares is “one-third.”</li> <li>• Write the words “one-third” on the board.</li> <li>• Another way we represent one-third is with symbols. It is written: <math>\frac{1}{3}</math>.</li> <li>• Explain to students that this is how we write 1 of 3 fair shares.</li> <li>• If students are using different shape pieces, be sure to have a conversation relating to the fact that the shape of the piece does not make a difference. The important idea is 1 of 3 fair shares.</li> <li>• Ask students to write <math>\frac{1}{3}</math> on one of their thirds.</li> <li>• Repeat the process for each of the pieces. Students will ultimately have written <math>\frac{1}{3}</math> on each of their pieces.</li> </ul>
<p><b>EXPLORE:</b></p> <p>Plain paper Crayons</p>	<p>Students draw figures that show wholes and thirds. Students color one-third the figure. Students label their figures “one-third” or <math>\frac{1}{3}</math>.</p> <p>As you confer, be sure to ask students how they know that they have colored in one-third (<i>there are three parts and they are fair shares</i>).</p>
<p><b>PRACTICE:</b></p> <p>TE and WB Pp. 357-358</p>	<p>As time allows, TE and Workbook Pp. 357-358</p> <p>As you monitor students as they complete the task, be sure to ask them how they know that they have circled or colored in the correct fraction (<i>there are two/four/three parts and they are fair shares</i>).</p>
<p><b>SUMMARIZE:</b></p> <p>Fraction cards, Module Pp. 293-297</p>	<p><b>Discuss:</b></p> <p>Some of the figures below are divided into thirds, and some are not. Analyze each figure with the students:</p> <div style="text-align: center;">  </div> <p>The whole is broken into three parts. Is each share one-third? Why not? <i>The parts are not fair shares.</i></p> <div style="text-align: center;">  </div> <p>The whole is broken into fair shares. Is each share one-third? Why not? <i>To have thirds, you need three parts making up the whole.</i></p>


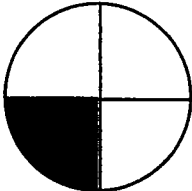
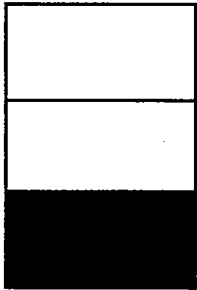
	 <p>Is this figure broken into thirds? How do you know? <i>There are three parts and they are fair shares.</i></p>
<b>HOMEWORK:</b>	<b>Suggestion:</b> <i>Family Involvement Activities: P. FA110</i>







**DAY 4**  
**Fractions**  
**Chapter 25: Fractions**  
**LESSON 25.4 TE P. 359A**

<b>LESSON FOCUS:</b>	<b>Problem Solving: Choose the Model</b>
<b>CALIFORNIA STANDARD:</b>	<b>Mathematical Reasoning</b> 1.2: Use tools, such as manipulatives or sketches, to model problems.
<b>PURPOSE OF LESSON:</b>	To demonstrate understanding of $1/2$ , $1/4$ , and $1/3$ by solving problems.
<b>ROUTINE:</b>  Instant Recognition cards, Module Pp. 301-305	Suggestion:  <b>Instant Recognition Cards:</b> (see following pages) Students look at the representation and name the fractional part shaded. Ask, "How do you know?" (number of parts; they are fair shares) "How could we write the fraction using numbers?"  <div style="display: flex; justify-content: space-around; align-items: center;">    </div>
<b>LAUNCH:</b> <i>For each student, 4 layer "fraction cake"</i>	<b>Introduce Activity: Problem Solving Using Fraction Cake</b> <ul style="list-style-type: none"> <li>• Explain to students that today we will use our fraction cakes to help us solve problems.</li> <li>• Students keep their books closed. Teachers use the questions on TE P. 359 but change "pizza" to "cake" and have students use their fractional pieces to solve the problems.</li> <li>• Next, explain that even though we are calling our model a "cake," it really can help us solve fraction problems about anything.</li> <li>• For example, ask questions about cookies, pie, brownies, etc.</li> <li>• Children use their pieces to solve the problem.</li> </ul>
<b>EXPLORE:</b> Student book P. 360	Students solve fraction problems and use models to show their thinking. Student book P. 360.
<b>PRACTICE:</b> <i>Practice 25.4</i>	<b>As time allows: Practice 25.4</b>

<b>SUMMARIZE:</b>	<i>Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson.</i>  <b>Discuss and Write:</b> "Discuss and Write" TE P. 360. Students can show how they know with their fraction pieces.
<b>HOMEWORK:</b>	<b>Suggestion:</b> Reading Strategy 25.4 (See bottom margin TE P. 360)

