



San Diego Unified School District

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Instructional Module to Enhance the Teaching of

**H A R C O U R T**

**Math**

**California Edition**

**Grade 1**

**Module 5–Revised**

**Graphing**

-WORK IN PROGRESS -

Revised 1/12/04

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**MODULE 5 – GRAPHING**

**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.
- 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 a collection of objects with various attributes can be classified or sorted in different ways.*
- *Students organize data about objects with tally marks, charts, pictures, and graphs.*
- *Students identify, describe, extend and explain repeating patterns.*
- *Students interpret graph data.*

\* Essential learnings listed above will be developed by students over the course of the year.

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

- How can I identify, describe, extend and explain repeating patterns? \*\*
- How can I sort and classify objects according to their attributes? \*\*
- How can I organize data using charts, pictures or graphs?
- How do I interpret graph data?
- What questions can I generate about the data displayed in graphs, charts, and tally marks?

\*\*Previously presented in kindergarten.

**Resources:** Van de Walle, Chapter 22, pp. 417 - 425

**Harcourt Math – Grade 1**

**Module 5**

**Graphing**

**4 Days**

**Key Mathematical Concepts:**

- Sort and classify objects by attributes
- Organize and display data in tally charts, picture graphs and bar graphs
- Solve problems by using an appropriate strategy

<b><u>Unit 4, Chapter 15: Data and Graphing</u></b>		
<b><u>DAY</u></b>		
1	15.1 & 15.2	Sort, Classify and Make Tally Charts
2	15.3	Picture Graphs
3	15.4	Bar Graphs
4	15.5	Problem Solving: Make a Graph

<b><u>Day 1</u></b>	<b><u>Day 2</u></b>	<b><u>Day 3</u></b>	<b><u>Day 4</u></b>	
Unit 4 Lesson 15.1	Unit 4 Lesson 15.3	Unit 4 Lesson 15.4	Unit 4 Lesson 15.5	
Sort and Classify	Picture Graphs	Bar Graphs	Problem Solving	
Lesson 15.2				
Make Tally Charts				



For partners, paper bag, objects to sort, blank paper A  TE pg. 216	<p>Introduce Explore:</p> <p><b>Alternative Teaching Strategy, TE pg. 216A</b></p> <ul style="list-style-type: none"> <li>To meet the needs of different ability levels, increase the variety of objects in the bag.</li> <li>For example, while some partnerships may only be sorting and tallying red and blue connecting cubes, you may provide other partnerships with bags containing red and blue cubes and red and blue crayons. Still other pairs may be sorting and tallying a bag of coins.</li> </ul>
<b>EXPLORE:</b>  TE pg. 216A	Students work in pairs <b>Sorting and Tallying, Alternative Teaching Strategy, TE pg. 216A</b>
<b>PRACTICE:</b> TE and Workbook pg. 215-216	<b>As time allows: TE and Workbook pg. 215</b>
<b>SUMMARIZE:</b>	<p>Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson.</p> <p><b>Discuss:</b></p> <ul style="list-style-type: none"> <li><i>How could you sort the people in our class?</i></li> <li><i>Can anyone think of another way to sort the people in our class?</i></li> <li><i>How could we record this information with tally marks?</i></li> </ul>
<b>HOMEWORK:</b> FA pgs. 65, 66, 69 or Workbook pg. 216	<p><b>Suggestions:</b></p> <p>Family Involvement Activities pg. FA65-66,69 <b>Or</b> Workbook pg. 216</p>

**DAY 2**  
**Chapter 15: Data and Graphing**  
**LESSON 15.3, TE pg. 217A**

**Math Background:** Picture graphs are another way to collect and display data. If the pictures are drawn in a grid, picture graphs are an easy step to bar graphs. Picture graphs represent data by using a picture to represent to the item counted

Like all graphs, picture graphs should be titled, and the bars within the graph should also be identified and labeled.

<b>LESSON FOCUS:</b>	<b>Picture Graphs</b>
<b>CALIFORNIA STANDARD:</b>	<b>Statistics, Data Analysis and Probability 1.2</b> Represent and compare data by using pictures, bar graphs, tally charts, and picture graphs.
<b>Purpose of Lesson:</b>	To make and interpret picture graphs and learn how to apply them.
<b>ROUTINE:</b> TE pg.217A Self Stick Notes  <u>For the Teacher</u> <ul style="list-style-type: none"> <li>• Pennies or other counters, a cup</li> </ul> <u>For the students</u> <ul style="list-style-type: none"> <li>• scratch paper</li> </ul>	<b>Suggestion:</b> <b>Daily Routine TE pg. 217A, "Cast Your Vote"</b>  Or <b>Count and Tally Practice:</b> <ul style="list-style-type: none"> <li>• Ask students to count aloud as you drop pennies or some other counter into a cup.</li> <li>• For example, drop 8 pennies one at a time while students count. Then write the number 8 on the board.</li> <li>• Ask students to write the number 8 on scratch paper. Dump the 8 pennies back into your hand.</li> <li>• Drop them again one at a time into the cup asking students to tally each time you drop a penny.</li> <li>• Review what to do for the fifth tally mark.</li> <li>• Continue with varying numbers.</li> </ul>
<b>LAUNCH:</b> Materials <u>For each child:</u> One Self-stick Notes	<b>Introduce Explore:</b> <i>Getting Started: Make a Picture Graph</i> On board, make a graph titled: <i>The Ways We Go to School</i> On the x-axis, label the titles: <i>Bike, Walking, Bike, Car</i> <ul style="list-style-type: none"> <li>• Have students draw a picture on a post-it of either a car, bus (should be yellow to distinguish from car drawings which might be similar), a shoe (to indicate walking), or a bike</li> <li>• Have students place their post-its on the class graph in the correct column.</li> <li>• <i>ASK: How many students walk? Ride the bus? etc. How many more students walk than ride? How many fewer take the bus than get rides?</i> (Comparison question can be challenging for young learners, but this is a great opportunity to explore another model of subtraction rather than just take away. They might be encouraged to make partner pairs with each square and then decide how many squares did not have partner pairs in order to decide how many more.)</li> </ul>

<p><b>EXPLORE:</b>  <u>For each child</u>          Self-stick note,          crayons, large sheet          of paper</p>	<p><b>Alternative Teaching Strategy, TE pg. 218A</b></p> <ul style="list-style-type: none"> <li>• Have each child draw his/her favorite toy on a post-it. The group then sorts the pictured toys by type ( you can limit the categories if you like: cars, dolls, Legos, and games.)</li> <li>• Help each group then make a picture graph with the sorted pictures. Have them label and title the graph.</li> <li>• Have children use the graph to answer the questions. <i>How many toys are there in all? Which toy do the children like the most? The least? How many more/fewer children like dolls than games?</i> Continue to ask comparison questions.</li> </ul>
<p><b>PRACTICE:</b>          TE and Workbook pg.          217</p>	<p><b>As time allows, TE and Workbook pg. 217</b></p>
<p><b>SUMMARIZE:</b></p>	<p>Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson.</p> <p><b>Discuss and Write:</b></p> <ul style="list-style-type: none"> <li>• Ask students, <i>"What can we learn about our class by looking at our graph? What does the graph show us? Or, put another way, what information can we learn by looking at our graphs?"</i></li> <li>• Students share some information with the class.</li> <li>• Writing activity: <i>"Write, using words, at least two different items of information or two things you can learn about our class mates by looking at our graphs."</i></li> </ul>
<p><b>HOMEWORK:</b></p>	<p><b>Suggestions: Challenge 15.3</b>  <b>Or</b>  <b>Workbook pg. 218</b></p>

**DAY 3**  
**Chapter 15: Data and Graphing**  
**LESSON 15.4, TE pg. 219A**

<b>LESSON FOCUS:</b>	<b>Bar Graphs</b>
<b>CALIFORNIA STANDARD:</b>	<b>Statistics, Data Analysis and Probability 1.2</b> Represent and compare data by using pictures, bar graphs, tally charts, and picture graphs.
<b>Purpose of Lesson:</b>	To learn how to use data from a tally chart to make a bar graph.
<b>ROUTINE:</b> TE pg.217A  <u>For the Teacher</u> <ul style="list-style-type: none"> <li>• pennies or other counters</li> <li>• a cup</li> </ul> <u>For the students</u> <ul style="list-style-type: none"> <li>• _scratch paper</li> </ul>  TE pg.219A	<b>Suggestion:</b> <b>Daily Routine TE pg. 217A, "Cast Your Vote"</b>  Or <b>Count and Tally Practice:</b> <ul style="list-style-type: none"> <li>• Ask students to count aloud as you drop pennies or some other counter into a cup.</li> <li>• For example, drop 8 pennies one at a time while students count. Then write the number 8 on the board.</li> <li>• Ask students to write the number 8 on scratch paper. Dump the 8 pennies back into your hand.</li> <li>• Drop them again one at a time into the cup asking students to tally each time you drop a penny.</li> <li>• Review what to do for the fifth tally mark.</li> <li>• Continue with varying numbers.</li> </ul> Or <b>Make a Bar Graph, TE pg. 219A:</b> Part I (the first bullet only)
<b>LAUNCH:</b> TE pg. 220A <u>For each child</u> <ul style="list-style-type: none"> <li>• One 2-color counter</li> <li>• paper cup</li> <li>• red and yellow crayons,</li> <li>• Tally Table pg.TR107</li> <li>• 1-inch grid paper (pg.TR100) or 2 pieces of blank paper if you want students to create their graphs from scratch.</li> </ul>	<b>Introduce Explore:</b> <b>Advanced Learners, TE pg. 220A</b> Introductory question: <i>If you toss a two-sided chip 10 times, do you think you will see red more often, yellow more often, or the same amount of each color? Why do you think this?</i> <ul style="list-style-type: none"> <li>• If you choose to have students create their own graphs, review the process.</li> <li>• If you choose to use the blackline masters in the <b>Teacher's Resource Book (TR107)</b>, review how they are to be used.</li> </ul>

<b>EXPLORE:</b> TE pg. 220A	<b>Advanced Learners, TE pg. 220A</b> Students work in pairs. Students toss two-sided chip 10 times and create tally chart and bar graph
<b>PRACTICE:</b> TE and Workbook pg. 219	<b>As time allows: TE and Workbook pg. 219</b>
<b>SUMMARIZE:</b>	Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson.  <b>Choose a student's bar graph and a tally chart to discuss (describing the same data):</b> <ul style="list-style-type: none"> <li>• <i>What information are we learning from this bar graph?</i></li> <li>• <i>What information are we learning from this tally chart?</i></li> <li>• <i>How is this tally chart and bar graph like your tally chart and bar graph? How are they different?</i></li> <li>• <i>When would you use a tally chart? (counting, keeping track)</i></li> <li>• <i>When would you use a bar graph? (comparing easily and quickly)</i></li> </ul>
<b>HOMEWORK:</b>	<b>Suggestion:</b> <b>Family Involvement Activities pg. FA67</b> Or <b>Workbook pg.220</b>



TE and Workbook pg. 222 (#1 and #2)	<p><b>Introduce Explore: TE and Workbook pg. 222 (#1 and #2 only)</b></p> <ul style="list-style-type: none"> <li>• Before students begin, brainstorm strategies for getting the information from their classmates.</li> </ul> <p>Ask questions like,  <i>How will you make sure you ask every person in our class?</i>  <i>How will you make sure not to ask the same person twice?</i></p>
<b>EXPLORE:</b> TE, pg 222, #1 and #2	Students work independently surveying their classmates and completing pg. 222 (#1 and #2).
<b>PRACTICE:</b> Practice Master 15.5	<b>As time allows: Practice 15.5</b>
<b>SUMMARIZE:</b> TE and workbook pg. 222	<p>Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson.</p> <p><b>Write About It: TE and Workbook pg 222.</b></p>
<b>HOMEWORK:</b>	<b>Suggestion: Family Involvement Activities pg. FA68</b>