San Diego Unified School District

Instructional Module to Enhance the Teaching of

HARCOURT

Math

California Edition

Grade 1

Module 8 - Revised

Patterns

-WORK IN PROGRESS –

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

MODULE 8 – PATTERNS

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 and translate the same pattern in different forms: physical, geometric and numerical situations (e.g., blue triangle, red triangle, blue triangle, red triangle = ABAB).*
- *Students extend, describe, and identify patterns by referring to shapes, sizes, colors, or repeating units.*
- *Students recognize that patterns have a sequence of elements or units that are repeated in ordered and predictable ways.*
- *Students look for order in situations and events around us.*
- *Students translate patterns from one medium to another (e.g. manipulatives to drawings, letters or numbers).*

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

- How do I identify the *repeating elements*** or units in a pattern?
- How can I describe a pattern using ABC's, drawings or manipulatives?
- How do I know what comes next in a pattern?
- How can I extend a known patterns?
- How can I translate a pattern from one medium to another (e.g., .manipulatives,,drawings or ABC's)?

**Previously presented in kindergarten

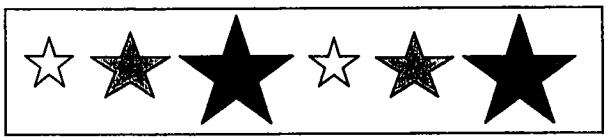
Resources: **Van de Walle, Chapter 22, pp. 417-420**

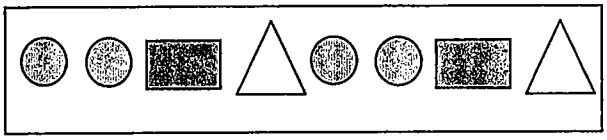
DAY 1
Chapter 22: Patterns
LESSON 22.1 TE P. 315A

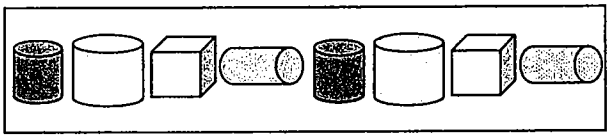
LESSON FOCUS:	**Describe and Extend Patterns**
CALIFORNIA STANDARD:	**Statistics, Data Analysis, and Probability 2.1** Describe, extend, and explain ways to get to a next element in simple repeating patterns
PURPOSE OF LESSON:	Students learn to identify, describe and extend patterns.
ROUTINE: *TE and Workbook P. 313* *TE P. 315* *TE P. 315A* *For the teacher, either colored chalk, whiteboard markers, or overhead markers. For the students, pattern blocks or connecting cubes.*	**Suggestion:** • Introducing the Chapter: TE P. 313 Or • Quick **Review:** TE P. 315 Or • Getting Started: Model a Pattern: TE P. 315A • Continue questioning each day: *"How did you think about the problem to come up with that answer?"* *"Did anyone think about it another way?"* *"Do you agree or disagree with this response?"* *"What was your strategy?"* *"Explain how you got your answer."*
LAUNCH: *10 to 20 strips of tagboard or construction paper with patterns drawn on by teacher, simple materials to match strips, such as, connecting cubes, pattern blocks, buttons, colored blocks, toothpicks, paper clips, attribute links, etc.*	**Introduce Activity: Pattern Strips** • Students can work independently or in pairs to extend patterns made from simple materials, such as: connecting cubes, pattern blocks, buttons, colored blocks, toothpicks, paper clips, attribute links, etc. • Teacher Prep: For each set of materials that you select, draw 2 or 3 complete repetitions of a pattern on strips of tagboard or construction paper (about 3" by 24"). See examples below. • Students' Task: Ask students to use the materials to copy the pattern shown on the tagboard strip and extend it as far as they wish. • As students work, ask questions like: *"How can you describe your pattern? Where does your pattern start over each time?" "How did you know what came next?"* • Ask students to find and extend another pattern using different materials. (NOTE: Challenging students to translate a pattern from one medium to another, even though made with different materials helps students focus on the relationships that are the essence of repeated patterns.)
EXPLORE:	**Students work individually or in pairs on Pattern Strips Extensions.** • Note during the Explore which students are having difficulty when asked "What comes next " and "How do you know what comes next?"

PRACTICE: *TE and Workbook P. 315*	**As time allows: TE and Workbook P. 315**
SUMMARIZE:	• Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. **Discuss:** Ask students to describe their pattern to a partner. • Call upon students to share their pattern description with the class. • Ask the class questions about student patterns, such as, *"How did you know what would come next?"* • Ask the pattern builder to close his eyes while you remove an item form his pattern. • Ask him/her to open his/her eyes and determine which item you removed.
HOMEWORK:	**Suggestion:** • Use some items from your silverware drawer at home to make a pattern. Describe it to someone at home. Draw a picture of your pattern to bring back to school. Or **Family Involvement Activities P. FA97** Or **TE P. 316**

"When possible, patterning activities should involve some form of physical materials. This is especially true of repeating patterns in grades K-4. When patterns are built with materials, children are able to test the extension of a pattern and make changes without fear of being wrong." Elementary and Middle School Mathematics, Van de Walle.







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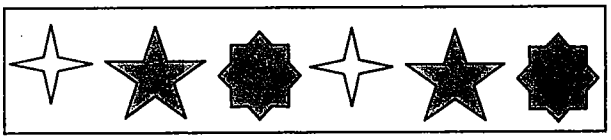

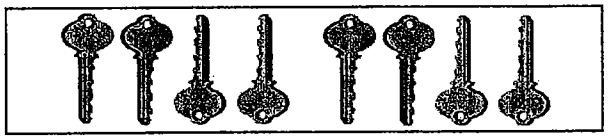

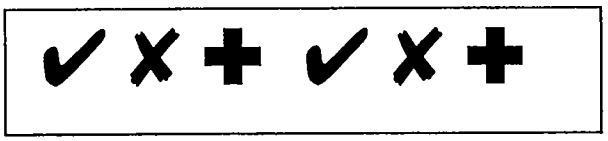

DAY 2
Chapter 22: Patterns
LESSON 22.2 TE P. 317A

LESSON FOCUS:	**Describe and Extend Patterns**
CALIFORNIA STANDARD:	**Statistics, Data Analysis, and Probability 2.1** Describe, extend, and explain ways to get to a next element in simple repeating patterns
PURPOSE OF LESSON:	To learn to copy a pattern and identify the pattern unit.
ROUTINE: *TE p. 317A*	**Suggestion:** • Daily Routine: TE P. 317A • After students line up boy-girl-boy-girl, teach them how to use an, A, B method of describing the pattern (boy-girl-boy-girl is A B A B). Then ask them to line up boy-girl-girl and describe the pattern using the A, B method. Next create an A B C pattern by inserting chairs into the pattern. (Boy-girl-chair-boy-girl-chair) Continue as necessary.
LAUNCH: *For teacher, overhead transparency of workbook p. 318.* *For students, blank paper, shape templates if available (students could also use pattern blocks, coins, to trace around)*	**Introduce Activity: Pattern Match** • Make an overhead transparency of student workbook P. 318. (It will work fine as a black and white copy.) Review how to describe these patterns using the A, B, C method. • Ask half of the class to close their eyes. Point to a pattern and ask the other half of the class to describe it using the A, B, C method. After hearing the pattern, the students open their eyes and try to determine which pattern was read. Since some of the patterns have the same structure, the discussion can be interesting and engaging. • Tell students that describing a pattern using the A,B,C method can help determine the "pattern unit." A pattern unit is a group of shapes or colors that repeat to form a pattern; that is, where the pattern starts over each time. Every time you say the first A in a series, that shows where the pattern unit begins. • Ask students to number 1-6 down the left side of a blank piece of paper. Instruct them to use a pencil to draw only the pattern unit for each of the patterns on the overhead. If you have shape templates, students may use them or draw the shapes freehand.
EXPLORE:	• Students work individually or in pairs drawing the pattern units. Note • During the Explore which students can extend the pattern, but not describe the pattern. Can they answer: • *"What comes next "* and *"How do you know what comes next?"* Noting answers to these questions helps you to document which students are meeting the standard and which students need more time.
PRACTICE: *materials from Day 1 such as, connecting cubes, pattern blocks, buttons, colored blocks, toothpicks, paper clips, attribute links, etc.*	**As time allows,** • Students continue yesterday's activity "Pattern Strips" using materials they haven't yet tried.
SUMMARIZE:	Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. **Discuss:** Ask students to show or explain in words, "What is a pattern unit?"

DAY 3:
Chapter: 22 Patterns
LESSON 22.3 TE P. 319A

LESSON FOCUS:	**Make New Patterns**
CALIFORNIA STANDARD:	**Statistics, Data Analysis, and Probability 2.1** Describe, extend, and explain ways to get to a next element in simple repeating patterns.
PURPOSE OF LESSON:	To learn to make different patterns using the same shapes.
ROUTINE: *TE P. 319*	Suggestion: **Quick Review:** TE P. 319 Or **Pattern Match:** (See Day 2 LAUNCH) Make different patterns by drawing on the overhead.
LAUNCH: *Simple materials from Day 1. such as connecting cubes, pattern blocks, buttons, colored blocks, toothpicks, paper clips, attribute links, etc.*	**Introduce Activity:** Same Stuff, Different Pattern • Children work in small groups creating as many patterns as they can using the same set of materials • Use the simple materials you gathered for the Day I Activity, "Pattern Strips." Give each small group a different material to work with. • Ask students to work together to make a pattern and think of as many ways as they can to describe it. Leave that pattern in place and create a new pattern using the same materials. Again ask students to describe this pattern as many ways as they can. Continue.
EXPLORE:	• Students work in small groups creating and describing different patterns.
PRACTICE: *TE and Workbook P. 319*	**As time allows,** • TE and Workbook P. 319
SUMMARIZE:	• Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. • Discuss and Write: *"If I make a pattern that is, fork, knife, spoon, fork, knife, spoon, how can you change it but still use the fork, knife and spoon?"* • Draw a pattern using a fork, knife and spoon in your journal that is different from mine. In your journal describe how our patterns are different.
HOMEWORK	**Suggestion: Challenge 22.3** (See bottom margin p. 320) or TEp.30

DAY 4
Chapter 22: Patterns
LESSON 22.4 TE p. 321A

LESSON FOCUS:	**Problem Solving: Find a Pattern**
CALIFORNIA STANDARD:	**Statistics, Data Analysis, and Probability 2.1** Describe, extend, and explain ways to get to a next element in simple repeating patterns
PURPOSE OF LESSON:	To use the problem-solving strategy *look for a pattern to solve problems.*
ROUTINE: *TE P. 321A*	**Suggestion:** • Getting Started: Reading Support: TE P. 321A Or • Problem of the Day: "You can use numbers to make patterns. 2,4,6,8... • *What is the pattern?* 10,20,30,40... • *What is the pattern?* • *Can you use the Hundred Chart to show these patterns? Can you find any other number patterns on the Hundred Chart?"*
LAUNCH: *Pattern strips and simple materials from Day 1.*	**Introduce Activity: What's Wrong with My Pattern?** • Children work in pairs identifying mistakes in patterns. • Instruct students to work individually to create a pattern using the Pattern Strips and simple materials from Day 1. Then ask them to switch two of the items' placement in their pattern; therefore, "messing it up." Partners try to uncover the mistake and correct it. • Continue with different pattern strips.
EXPLORE:	• Students work in pairs identifying and correcting mistakes in patterns.
PRACTICE:	• While students are working independently in their partner pairs, you may want to complete the assessment for the test from AG P. 139-140.
SUMMARIZE:	• Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. **Discuss:** • Ask students to close their eyes. • Rearrange some of the numbers in your Hundred Pocket Chart. Ask students to quietly raise their hand when they spot a mistake. As most of the hands appear, call on students to explain the mistake, how to correct it and the pattern they see on the Hundred chart that helped them with their thinking. • Continue until all mistakes are corrected.
HOMEWORK:	**Suggestion: Reading Strategy 22.4** (See bottom margin P. 320) or TE 321-322