*Ch. 14 Algebraic Thinking: Generalizations, Patterns, and Functions*

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| **Representative TN State Curriculum Standards**  *1st Grade*  GLE:  0106.3.1 Identify, describe, and extend simple number patterns to develop strategies for adding and subtracting whole numbers.  0106.3.2 Understand that addition and subtraction are inverse operations.  Checks for Understanding  0106.3.1 Find repeating patterns on the number line, addition table, and hundreds chart.  0106.3.2 Determine a reasonable next term in a given sequence and describe the rule.  0106.3.5 Use various strategies to find unknowns in problems involving addition and subtraction.  *2nd Grade*  GLE:  0206.3.1 Develop Pattern Recognition  0206.3.3 Solve simple arithmetic problems using various methods.  Checks for Understanding  0206.3.1 Given rules, complete tables to reveal both arithmetic and geometric patterns.  0206.3.2 Given a description, extend or find a missing term in a pattern or sequence. | |
| ::Desktop:51iReolNYIL._AA160_.jpg  Time: 10 Minutes | Used to develop the concept of the equal sign.  Tilt or Balance:   * Have student’s draw a simple two-pan balance on their Smartpal. * Write a numeric expression in each pan and ask which pan will go down or whether the two will balance. * Have the students write expressions on each side to make the scales on each side balance, which will illustrate the meaning of the equal sign. * Tell the students that when the scale “tilts” then it is either “greater than” or “less than.” |

**Virtual Manipulatives Time:** 8 Minutes

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| *Pan Balance - numbers*  [**http://illuminations.nctm.org/ActivityDetail.aspx?ID=26**](http://illuminations.nctm.org/ActivityDetail.aspx?ID=26)  Objective: the player can make up an equation in each pan. Depending on what the teacher asks, the player can make the equations balance or be greater/less than. |
| *Interactive Algebra Tiles*  <http://www.allenteachers.com/resources/algebra-tiles/>  Objective: player can display different patterns. Player can tell teacher what patterns they are making. Teacher can also ask students to show specific patterns with these Algebra tiles. |

**Activities from the textbook**

**Materials needed:**Smartpals, plain white paper, hundreds charts of different widths, whiteboard/markers.

1. Figure 14.2 Patterns on Hundreds Charts of different widths p. 256; 5 minutes
2. Topic: Generalization in the Hundreds Chart
3. Activity 14.4 Tilt or Balance p. 259; 5 minutes
4. Topic: The meaning of the Equal Sign
5. Variations: use greater/less than signs
6. Activity 14.5 True or False p. 260; 5minutes
   1. Topic: True False and Open Sentences
   2. Variations: explore equations that are in a less familiar form.
7. Activity 14.6 Open Sentences p. 260; 5 minutes
   1. Topic: True False and Open Sentences

**Additional Activity: Making Pattern Strips p.267;** 10 minutes

**Materials:** connecting cubes, patterns on strips of paper

Students make the pattern that is on a strip of paper. Once they have made that pattern, have them extend the pattern as far as they would like to. Have them choose another pattern and try it again. Allow them to use other manipulatives as well.

**Lesson Plan**

Hexagon Dragons

[**http://www.mathwire.com/algebra/growingpatterns.html**](http://www.mathwire.com/algebra/growingpatterns.html)

Students will create a pattern using blocks, a pattern to look like a dragon. The teacher will have to assist students by showing them the first dragon pattern. Have the students predict what the next dragon will look like as they extend the pattern. Allow them to use any colors they would like, as long as they are making a pattern.

Variation: for older grades, have students complete the table of values for the dragon pattern.