Domain: Operations and Algebraic Thinking Standard Code: 4.OA.5 Author Name: Anderson, Morgan, Johnson, and Lloyd

Title of Task: The Box Top Competition

Adapted from: Smith, Margaret Schwan, Victoria Bill, and Elizabeth K. Hughes. "Thinking Through a Lesson Protocol: Successfully Implementing High-Level Tasks." *Mathematics Teaching in the Middle School 14* (October 2008): 132-138.

PART 1: SELECTING AND SETTING UP A MATHEMATICAL TASK	
What are your mathematical goals for the lesson? (i.e., what do you want students to know and understand about mathematics as a result of this lesson?)	Students will identify and generate a number pattern that follows a given rule. They will identify apparent features of the pattern that were not explicit in the rule itself. They will explain informally why the numbers will continue to alternate in this way.
• What are your expectations for students as they work on and complete this task? • What resources or tools will students have to use in their work that will give them entry into, and help them reason through, the task? • How will the students work—independently, in small groups, or in pairs—to explore this task? • How will students record and report their work?	Students will be expected to participate in the task using appropriate voice levels and everyone will be accountable for the information gathered. Students will use their math journals, pencils, crayons, pattern block manipulatives, chart paper, and other classroom supplies as needed. Students will work as individuals on this task, but will be able to access peer feedback during the task. Student will record their work in their math journals, on their task sheets, and will show their work on the classroom document camera. Students will justify their process to the class.
How will you introduce students to the activity so as to provide access to *all* students while maintaining the cognitive demands of the task?	Talk about your local school's Box Top Contest. Create an environment of excitement about the contest, by talking about last year's result. Tell the students that we will be figuring out the pattern of Box Tops that are being brought into a specific 4^{th} Grade Class.

PART 2: SUPPORTING STUDENTS' EXPLORATION OF THE TASK	
As students work independently or in small groups, what questions will you ask to— • help a group get started or make progress on the task? • focus students' thinking on the key mathematical ideas in the task? • assess students' understanding of key mathematical ideas, problem-solving strategies, or the representations? • advance students' understanding of the mathematical ideas?	What things do you notice about the pattern for this class? Are we able to use pictures, graphs, or other visuals to solve this? Can you find another way to solve this problem? What would be a good starting place for this task?
How will you ensure that students remain engaged in the task? • What assistance will you give or what questions will you ask a student (or group) who becomes quickly frustrated and requests more direction and guidance is solving the task? • What will you do if a student (or group) finishes the task almost immediately? How will you extend the task so as to provide additional challenge?	Help the student see that the pattern can be broken apart to gain a solution. Help the student see what they already know. Prompt students as needed, to establish confidence in task. Students will generate a pattern that will ensure 1st place in the Box Top Contest. Students will answer extension questions from the task sheet.

PART 3: SHARING AND DISCUSSING THE TASK	
How will you orchestrate the class discussion so that you accomplish your mathematical goals? • Which solution paths do you want to have shared during the class discussion? In what order will the solutions be presented? Why? • What specific questions will you ask so that students will— 1. make sense of the mathematical ideas that you want them to learn? 2. expand on, debate, and question the solutions being shared? 3. make connections among the different strategies that are presented? 4. look for patterns? 5. begin to form generalizations?	The teacher will find multiple strategies from the class that can be shared during the debrief class discussion. The teacher will start with the most basic strategy working up to the most complex. Class will discuss the results of the shared strategies sharing what was similar and what was different. Are there other ways to solve this problem that were not shared? Did anyone come up with another way to solve the problem, after watching other students share?
What will you see or hear that lets you know that *all* students in the class understand the mathematical ideas that you intended for them to learn?	Debrief the task with the class talking about the mathematical concepts that were taught. Make sure the objective for the lesson was reached.

Box Top Contest

Your school has been collecting Box Tops for your annual Box Top Contest. As a student, you are trying to find a pattern in the Box Tops already turned in by Mrs. Box and Mr. Top to ensure a victory for your homeroom class. Answer the following questions, making sure that you can prove your answer through the work on the back of your task sheet.

Month	Mrs. Box	Mr. Top	
Sept.	345	480	
Oct.	360	463	
Nov.	380	446	
Dec.	405	429	
Jan.			

1. What will be the number of Box Tops brought in for January for EACH class?
2. What is the "rule" for EACH class?

EXTENSION:

1. What is the total amount of Box Tops brought in by Mrs. Box's class, and Mr. Top's class. What is their combined total? Who won?
2. Create another class and pattern/rule, using the blanks on the chart. Have a friend solve and provide proof of their work.