**Domain: Expressions and Equations Standard Code: 6.EE.3 Teacher Name: Bullock and Emmons**

Adapted from: Smith, Margaret Schwan, Victoria Bill, and Elizabeth K. Hughes. “Thinking Through a Lesson Protocol: Successfully Implementing High-Level Tasks.”

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| **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?) | Apply the properties of operations to generate equivalent expression. Specifically, apply the distributive property to an expression to produce an equivalent expression. |
| * 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 write in their math journals.  Paper and pencil, mental math  Students will work independently at first and then pair share.  Students will record their choice of the most effective method on post-it easel pad paper to share with the class during the debrief. |
| How will you introduce students to the activity so as to provide access to *all*  students while maintaining the cognitive demands of the task? | Show you-tube clip or pictures of lego competition to hook interest. This is a two-part task. Don’t introduce part 2 until the re-launch.  Share the following:  Part 1  You have invited four friends to compete with you in a Lego Building Competition. The rules say you must each use 523 same colored legos to build your creations. You must supply your own legos. You found legos on sale in bulk at the LEGO store. Unfortunately, you arrived at the store with only half an hour left until the store closes and the sale ends that day. You do not have a calculator with you. Find at least two ways to figure out how many total legos you need for you and your friends. Then share with a partner to find the most effective way to find the total number of legos you need.  Part 2:  Now it doesn’t matter how many legos you use, they just have to be two different colors. However, each participant must have the same number of each color. Come up with at least two different expressions to represent the number of legos you and your four friends need to buy. Compare your expressions with your partner. Are they equivalent? |

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| **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 are you being asked to find? How many participants need legos? How many legos does each participant need?  Is this the most efficient way to find the number of legos? It there a faster way? What if you didn’t have paper and pencil? Is there an easier way?  Explain to me your thought process. Why do you think this is the most efficient strategy?  How does our strategy compare to your partner’s strategy? What is the same? What is different? |
| 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? | Let’s try it with smaller numbers. What if you only needed 52 legos per person? If that was still to frustrating, what if each person only needed 15 legos?  What if you needed each person to have 3524 legos? |

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| **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?  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? | Show the work from someone who made the problem simpler (i.e. with 15 or 52 legos). Next show the work from someone who added repeatedly, some who multiplied and someone who used the distributive property. Discuss the efficiency of each strategy. Were some strategies faster to use than others? Were some strategies easier to perform mentally? What if you didn’t have pencil and paper?  Students will recognize that using the distributive property was a much faster and efficient mental math strategy. As students present the distribute property as a strategy, be sure to name it as the distributive property. Re-launch with Part 2 of the task. |