***Lesson Plan Template for\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

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

*Mathematics Teaching in the Middle School 14* (October 2008): 132-138.

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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?) | Students will be able to find a variety of temperatures by adding and subtracting positive and negative temperatures. |
| 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? | Task Sheet  Blank Paper  Students will work alone and record their answers on their task sheet |
| How will you introduce students to the activity so as to provide access to *all*  students while maintaining the cognitive demands of the task? | Students will be given the following story: (Task Sheet)  In Sanpete, at 4 A.M. the air temperature outside was -4 degrees F. If the temperature rises consistently 1 ½ degree every 45 minutes, how many hours will it take for the temperature to reach 10 degrees F?  What time will it be when it is at least 10 degrees F?  A month later it was 24 degrees outside at 2 P.M. If the temperature drops consistently 1.75 degrees every hour, When will the temperature be at least 3 degrees below zero? |

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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? | * How would you organize the information? * Would drawing a picture help? * How many questions do you need to answer? * Can you explain individual parts of the solution. * Is the temperature warm and cooling or cool and warming? |
| 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? | Have students tell what they need to do next in the problem  Have students explain how they intend to solve the problem.  What manipulatives can be used to help you understand the problem better?  Is there an algorithm to solve the problem |

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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? | During student share, start with the students that had basic solutions (multiple addition) and then move on to the students that had more complex solutions (algorithms) |