***Lesson Plan Template SP 3***

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?) | Recognize the measure of centers and their purposes. Know and explain the difference between measure of center (**mean/median**) and measures of variation (**range**). |
| 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?   * How will students record and report their work? | paper and pencil, graph from SP 4  Work independently, then share with a partner.  Find the mean/median and range of data. |
| How will you introduce students to the activity so as to provide access to *all*  students while maintaining the cognitive demands of the task? | You will now present your data about conventions to the district writing assessment team. The information from the teachers in the district will help the team make decisions about professional development funding.  How will you numerically summarize all of your scores to efficiently communicate the center, spread, and overall shape? |

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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? | -Remember this isn’t about individuals but about general patterns and summarizing numerically.  -What other ways can you summarize this?  -How can you generalize that?  -You’ve done \_(mean)\_. What else might they need?  -Why did you choose that number?  -How did you get that number?  -How do the scores/numbers vary? |
| 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? | Frustrated:  -How are the scores distributed?  -Which occurs most often?  -Do you see any patterns?  -How do the scores vary?  Extensions:  -Once your done with conventions do Word Choice or Voice.  -Based on your numerical summaries, what direction would you recommend they take? Justify why. |

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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? | Possible solutions:  -range  -median  -mode  -mean  -distribution  -deviation  Share groups that found the mean, median, and range.  Questions:  -Explain how you got the mean/median/mode  Why would you use the mean? Median? Mode? Range?  -Why might you want the median instead of the mean?  -How are these numbers similar?  -How are these numbers different?  -How might the mean, median, or range influence the writing team?  -Why is the range/mean/median important?  -What if my scores were the same but my range was 10? 20? 100?  Find the mean, median, mode, range for another trait or data set. |