**Grant Goals:**

1. Increase teachers’ content knowledge in algebra and functions in the Common Core State Standards in Mathematics (CCSS),
2. Improve teachers’ instructional strategies in algebra,
3. Improve teachers’ understanding of and ability to teach the Standards for Mathematical Practice (SMP),
4. Use the Teacher and Principal Evaluation (TPEP) system to increase principals’/assistant principals’ knowledge of and ability to support improved mathematics instruction, and
5. Improve student achievement and interest in math.

**Goals of Summer Institute**

* Teachers question their beliefs and values about teaching, and consider their practices in light of these. Throughout each of the activities, reflect on how the ideas could be used to improve their practices. (Grant Goals 1, 2, and 3).
* What research says about good teaching (Adapt Table 3 in Swan, 2011, using HPL, Adding it Up). (Grant Goal 2)
* Enact and plan a lesson in order to be more intentional about what students learn from a rich task. (Grant Goal 2) Focus on Pedagogical Content Knowledge of:
  + Coherence
  + Representation
  + Discourse (build on from previous workshops)
* Mathematical Knowledge for Teaching: Develop a more ***coherent*** understanding of Algebra 1 ***concepts and procedures*,** as defined in the CCSS. (Grant Goal 1) This includes to understand and be able to describe ***prior knowledge***, including
  + Connecting the ideas and considering how students develop the ideas, and how procedures and concepts can support each other.
  + Comparing and contrasting linear, quadratic and exponential models; and
  + Comparing and contrasting equations, expressions, and functions.
  + Understand ***structure*** and its relationship to concepts, procedures, and mathematical practices.
* Engage in and examine the Standards for Mathematical Practices (SMP) to clarify what these mean in practice and to consider levels of engagement in the practices. Use Driscoll’s Fostering Algebraic Thinking to illustrate what these could look like in Algebra 1. (Grant Goal 3)
* PLC and individual development: Use and discuss norms that will promote teacher learning that leads to *self-sustaining generative change*. (Grant Goal 2)
* Classroom practices: how to get students to collaborate and engage productively in mathematical discourse in groups, how to use ***student work*** to help students make connections, and how to get students to ask good questions.
* Make connections to previous workshop ideas and lay foundations for new connections.

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| **Day 1** | | | |
| **Main task** | **Goals/ Connections** | | **Leader/ Materials/**  **Rolls of Peer teachers and Coaches/ Grouping** |
| 7:30-8:00 Introduction and goals for the three days | * Discuss productive norms for teacher learning. * Goals of productive norms are to support teacher inquiry learning and interdependence. * Eventual goal is that professional learning occurs through PLCs. * Umbrella idea for this SI: ***Teaching for Coherence*** | | Kris |
| 8:00: 9:00 Surfacing Beliefs Task | * Have teachers recognize and explore their current ***beliefs***, ***values, and related practices, as well as possible tensions between beliefs and practices*** | | Janet and Kathy  Cards for card sort (60 sets); baggies (60); Purposes&Activities (60); tape |
| 9:00-10:00 What research says about effective teaching of ***mathematics***. | * Consider what research says about effective teaching. | | Cheryl and Becky |
| 10:00-10:15 Break |  | | Snacks |
| 10:15-11:30 Coherence | * Help teachers develop a coherent understanding of one conceptual category of the CCSS (Functions) * Understand what is meant by coherence of the standards. | | Jackie and Hyung Sook  CCSS Functions (30), Finding Coherence in Functions (60); Coaches notes (12); Growing Rectangles Task (15); blank paper (100 half sheets) |
| 11:30-12:30 Lunch  Roles of teachers and students in learning | * Consider characteristics of group work that makes working in groups more effective for learning. * Roles of teachers during group work. * Brainstorm ways to apply this in our classrooms. * How to use student presentations to move whole class learning. | | Kris and Brandon |
| 12:30-2:30 Height of a baseball | * Engage in a quadratic investigation. * Understand and reflect on their own use of SMP and what SMP their students might use. | | Matt and Scott  Individual Organizers (60)  Group Organizer (17x22) (20)  Markers  Laptops |
| 2:30-2:45 Break | (Regroup so that each group has a teacher in it who has student work on the quiz.) | |  |
| 2:45-3:30 Quiz: student thinking | * Look at and understand student work from the common quiz. | | Jackie and Kathy  Protocol (20) |
| **Day 2 (Cathy Kennedy will take PLCs aside to talk throughout the day, so should teachers stay in their PLCS all day?)** | | | |
| 7:30-9:45 Staircase | * Enact the 5 (teaching) Practices with teachers as learners. * Understand structure of quadratic functions, and explore equivalent expressions. * Distinguish and relate expressions, equations, and functions and connect to the CCSS. | | Jackie and Cheryl  Poster paper  Blank sheets, both small and large  Tape  Graph paper  Staircase task, regular (60, 2sided)  Staircase Task with large diagrams (60)  Markers, different colors  2 boxes, labeled |
| 9:45-10:00 Break (15 minutes) | (Regroup so that teachers are not within their PLCs.) | | Snacks |
| 10:00-11:30 TIMSS video | * Develop ways of observing a lesson to connect teacher actions to student thinking. * Notice how the teacher has intentionally set up a task, supported development of student thinking, and sequenced and connected students’ work. * Notice teacher and student roles in the classroom and compare/contrast them with the roles they want in their classroom. | | Jackie  Protocol (60) |
| 11:30-12:30 Lunch  Creating a Collaborative Rich Task Lesson Planning Process | * PLCs create their own protocols: Collaborative Planning Process for teaching with a particular Rich Task (Groupworthy task). * Put on a poster and have a Gallery Walk to reflect on components | | Jackie and Hyung Sook  Posters, stickies |
| 12:30-1:45 Linear, exponential, or quadratic? | * Compare and contrast linear, exponential and quadratic functions. * Model the use of a card sort and the types of questions that can be asked. | | Cheryl and Sue  Cards (15 sets)  Task sheets |
| 1:45-2:00 Break |  | |  |
| 2:00-3:30 Small group discussion about ideas from first two days, then discussion with administrators about ideas | * Reflect on RAMP-A goals and individual progress toward them in light of Learning Engineer idea * Connect the big ideas of the first two days to RAMP- A and personal goals * Reflect on focus and coherence of their work in RAMP-A. * Identify strategies for team and RAMP-A support of goal achievement | | Janet, Erik, and Helene |
| 1:30-3:30 Principals/assistant principals join teachers (2 hours) | * Focus on PLC-building next year (TPEP Criterion 8). * Developing a mindset of professional growth in teachers. | | Erik and Helene |
| **Day 3 Lots of time to work in groups for planning/ critical friends** | | | |
| 7:30-8:00 Introduction | | * Time in PLCs to brainstorm questions? | Kris |
| 8:00-9:15 DTAMS | |  | Jackie |
| 9:15-9:30 Break (snacks) | |  |  |
| 9:30-10:30  Students’ questioning | | * Understand why students should ask questions * Consider and brainstorm ways to get students to ask better questions. | Kris |
| 10:30-11:30 Using your Collaborative Planning Process to plan a lesson with a rich task (Staircase) | | * Draft lesson plan. | Jackie and Hyung Sook  Project Leaders and Peer teachers with their groups all day, supporting the goals of the activities. |
| 11:30-12:30 Lunch  Critical friends | | * PLCs vet their plans so far with other groups to gain other perspectives and ideas to make their plans more detailed and clearly connect their plans to their purposes. | Kris?  Cathy’s questions at the end of this |
| 1:15-2:45 Demonstrating student learning in your lesson | | * Teachers envision how the lesson would play out to meet their purpose and create either a Task Dialogue or a video of a Task Dialogue (essentially a rehearsal of how the lesson could go) |  |
| 2:45-3:15 Closure (1/2 hour) | | * Teachers write a letter to themselves addressing: what have I learned about teaching the CCSS and how could that affect my teaching? What manageable steps can I take over the course of the next year? Do I still agree with the values I assigned on the first morning? * What do I still wonder about? |  |
| 3:15-3:30 Evaluations | |  | Evaluation on Googleforms; emailed to the teachers.  Give teachers student surveys for beginning of next school year |