District 105 Math Materials (K-8) Recommendation

April 25, 2016

What Brought Us to Examine Materials

- **Previous review model**
  - Every 5-8 years – new materials review
- **Common Core Standards adopted**
  - District 105 standards alignment focus 2012-present
  - New standards driving instruction
- **Publishers began developing materials to fill need - 2011**
  - Poorly aligned materials
  - Re-purposed materials – CCSS sticker!
  - Truly aligned materials not “out there” early in CCSS transition
- **Standards based teaching**
  - Teachers “know” the standards and know what kids must master
  - Use of multiple resources to support standards instruction
  - CCSS Math alignment materials now available
  - Teachers are better able to evaluate materials with critical eye
  - Able to determine strengths and limitations to any set of resources

Committee Members

Rachel Dickerson Spring Ave Kindergarten	**Sarah Rusk** Ideal School Kindergarten	**Wendy Daly** Spring Ave 2nd grade	**Alba Segura** Hodgkins Kindergarten/Bilingual	**Dee Morello** Spring Ave Resource
Lauren Parrino Spring Ave 1st grade	**Shannon Staley** Ideal Scholl 1st grade	**Shannon Tobin** Hodgkins 2nd grade	**Barb Hobe** Ideal School 3rd grade	**Jill Ruelas** 7th Ave 3rd grade
Amanda Adducci 7th Ave 4th Grade	**Brad Meyers** Spring Ave 5th grade	**Nicole Wanta** Spring Ave 6th grade	**Mark Bliss** 7th Ave 6th grade	**Susan Calder** Gurrie 8th grade
Tara Eiternick Gurrie 7th grade	**Jason Tooth** Gurrie 7th grade	**Emily Wiegand** AAD Math Specialist	**Eilidh Hall** AAD Math Specialist	**Martha Ramirez** Hodgkins EL teacher
Isela Mendez Ideal School EL teacher	**Marci Ortiz** EL Coordinator	**Steve Bahn** Ideal School Principal	**Crystal Conley** CEC Consultant	**Kathryn Heeke**

Current Math Programming - Kdg-8th

- Adopted K-6 programming – Everyday Mathematics
- Adopted 6-8 programming – McDougal Littel Course 1,2,3
- Focus on standards and assessment alignment – Perry Soldwedel (CEC)
  - Deep understanding of CCSS math
  - Focus on defining mastery
  - Pre-Post assessments provide timely data to inform instruction; goal setting
- Grade level scope and sequence/unit plans include all Math CCSS
- Use of multiple online resources to address CCSS and enhance rigor of instruction (i.e. Engage NY, NCTM, etc.)

Current Math Programming Overview – Kdg-8th

Strengths

- Common definition of standards mastery across grade level
- Learning targets connected to all standards
- Students have a better understanding of what they are learning and why
- Students are setting goals around their areas of improvement
- Parents are better informed of what students are learning and why through unit communication
- Common grade level pre and post assessments
- Assessments define what mastery should look like for all standards at that grade level
- Attention to rigorous instruction
  - SMART coaching, AAD specialist support, strong math resources online

Current Math Programming Overview – Kdg.-8th

Weaknesses

- Everyday Math and McDougall Littel materials do not provide teachers with adequate foundational materials to support Common Core Math standards/units of instruction
- District grade level teachers have common CCSS mastery expectations but not a common instructional path
- Missing guaranteed and viable curriculum for our students
  - Missing a common set of resources to support instructional path of core grade level instruction
  - Math instruction varies across the district causing inconsistencies in content taught
- Inconsistencies around resources have made it more difficult for grade level planning across the district

Committee Charge

- CCSS aligned math materials to support current instructional units
- Materials to support diverse needs
  - EL, advanced, below grade level, on level, IEP
- Materials to help parents connect/understand math instruction – examples:
  - rules, common language, common strategies, etc.
- Materials to better define common grade level instructional path
  - Common math vocabulary
  - Common strategies
  - Common resources available to all

Evaluation Process - What We Examined

- Review of 4 top math programs
- Selected based on independent CCSS alignment reviews including:
  - Edreports.org
  - Learninglist.org
- Programs reviewed:
  - <u>Elementary</u>
    - Everyday Math – McGraw Hill
    - My Math – McGraw Hill
    - Eureka Math – Great Minds
    - Stepping Stones – Origo

<u>Middle School</u>

-Glencoe Math – McGraw Hill

-Big Ideas - HMH

-Digits – Pearson

-Eureka – Great Minds

Evaluation Process – Review Criteria

- Crystal Conley – CEC Director of Teaching and Learning; math teacher
- Use of Instructional Materials Evaluation Tool (IMET) - AchievetheCore
- IMET helps educators determine alignment to CCSS – includes:
  - Non-negotiable Alignment Criteria
    - Programs being considered must include non-negotiable criteria
    - Ex. Materials relate on-grade level materials to prior knowledge; Materials give extensive opportunities with core grade level content
  - Three CCSS Alignment Criteria:
    - Balance and Rigor in the materials
      - Rigor = CCSS aligned
      - Balance = conceptual understanding, procedural/skill fluency, and application
    - Connection between content standards and 8 mathematical practices
    - Access to the Standards for ALL students

Evaluation Process – Additional Criteria

- **Materials must promotes differentiated instruction**
  - support our district RtI efforts (both intervention and enrichment)
- **Materials must support Common Language**
  - Teachers and students – common vocabulary, strategies, etc.
  - Parents - connect parents to common math rules/expectations, explanations
- **Materials must support consistent core math instruction**
  - Common materials/resources = common language spoken = guaranteed and viable instruction
- **Materials must support D105 CCSS units of instruction**
- **Materials must have professional development support around content instruction**

Evaluation Process – What Others Are Using

D101 Everyday Math K-5 Big Ideas 6-8 *Consultation Calls	**D102** Math Expressions K-5 Digits 6-8	**D103** Harcourt Math
D106 Envision K-8	**D107** Multiple resources K-5 Glencoe Math 6-8	**D64** (Park Ridge) My Math K-5 Glencoe Math 6-8 *School Visit
D54 (Schaumberg) Go Math K-8	**D97** (Oak Park Elementary) My Math K-5	**D204** (Indian Prairie) Everyday Math K-5 Digits 6-8
D203 (Naperville) Math Expressions K-5 Glencoe Math 6-8	**D96** (Riverside) Singapore Math K-5 Carnegie Math 6-8	**D58** (Downers Grove) Glencoe Math 6-8 *Consultation Calls
D95 (Lake Zurich) K-5 Stepping Stones *School Visit	**D181** (Hinsdale) Big Ideas 6-8 *Consultation calls	

Materials Selection Process

- **Compilation of all IMET data results**
  - Three alignment criteria
  - Non-negotiable criteria
- **Publisher presentations**
- **Comparison of all programs through IMET "lens"**
  - Materials must closely align with these criteria
  - Materials must best support D105 unit planning work.
- **Decision Making through District-wide vertical perspective**
  - focus on program strengths
  - Identification of program limitations
- **Mixed teacher teams throughout process**
  - Multiple perspectives across grade and schools
  - consecutive grade-levels (K-1st, 2nd-3rd, etc.)
  - mixed groups (K/ 3rd/6th, 1st/ 4th/7th)

Math Materials Recommendation K-8

Recommendation

- Elementary – *My Math* (K-5)
- Middle School – *Glencoe Math* (6-8)
- McGraw-Hill Publishing

Characteristics of the Programs

- Strong CCSS aligned math content – Rigor and Balance
  - Focus on conceptual understanding, procedural skill and fluency, and application
  - Includes performance tasks – application of CCSS math
- Emphasizes 8 mathematical practices
- Provides for stronger Guaranteed and Viable Curriculum
  - Common math vocabulary
  - Common math instructional strategies
  - Common math algorithms
  - Common set of foundational resources
  - Consistent instruction horizontally (grade level) and vertically (K-8)

Math Materials Recommendation K-8

Characteristics of the Programs, con't

- Flexibility
  - Selected materials offer flexibility to use with current scope and sequence/unit planning; support assessment development
  - Supplemental tasks include: real-world application, online parent support, online manipulatives
  - Other strong resources can be use WITH these materials to support rigor when needed
- Technology
  - Student edition online - engaging games; virtual manipulative; eHelp
  - Teacher edition online - video's of teaching models, lesson animations
  - Spanish materials online – teacher and student
  - Technology enhanced questions – ie. drag and drop
  - Targeted interventions around conceptual understanding
  - ALEKS - adaptive diagnostic formative tool

Math Materials Recommendation K-8

Characteristics of the programs, con't

- Differentiation and Scaffolded Instruction Supports
  - English Language Learners
  - Approaching level, on level, beyond level
  - recommendations/suggestions for modifications to instruction
  - ALEKS – adaptive diagnostic formative tool
- Spanish Materials – online and print
- Home-School Connection
  - Modeled examples - eHelp; lesson animations; virtual manipulatives
  - Math at Home Letters
  - Consumable textbook/workbook – explanations included
- McGraw Hill - Same writing team

McGraw- Hill Programming

Understanding by Design

- McGraw-Hill *My Math and Glencoe* continues this tradition through its implementation of Understanding by Design.
- Effective curriculum is planned backward from long-term, desired results through a three-stage design process (Desired Results, Evidence, and Learning Plan). This process helps avoid the common problems of treating the textbook as the curriculum rather than a resource

Embedded ALEKS in Glencoe Math

- ALEKS stands for "Assessment and LEarning in Knowledge Spaces."
- ALEKS was developed by a team of software engineers, mathematicians and cognitive scientists with grant from National Science Foundation (NSF).
- The technology is based on 20+ years of rigorous brain research that originated at the NSF, resulting in artificial intelligence that assesses students individually and provides adaptive learning paths.

National Research Council

Which Curriculum Is Most Effective in Producing Gains in Students' Learning?

- Examined patterns emerge from several large-scale studies that compared achievement in classrooms using *standards-based curricula* to achievement using *conventional curricula*.

- Students taught using a *standards-based curriculum*, compared with those taught using more conventional curricula, generally exhibited *greater conceptual understanding* and performed at *higher levels with respect to problem solving*.

- These gains did not appear to come at the expense of those aspects of mathematics measured on more traditional standardized tests. Compared with students taught using conventional curricula, students who were taught using *standards-based curricula generally performed at approximately the same level on standardized tests* that assess mathematical skills and procedures.

Cost Details – My Math and Glencoe Math

- Cost includes critical program items:
  - Student consumable textbook/practice book
  - Student online access (Spanish/English)
  - Teacher online access (Spanish/English)
  - Teacher edition – online and print
  - Embedded ALEKS program – Glencoe Math (grades 6-8)
  - Spanish consumables and technology
  - Three professional development sessions
  - Supplemental resources for differentiation/intervention support

- Program Total K-8th Grade - $100,000
  - 3 years of materials with no new costs
  - Add-on option – ALEKS stand alone program (grades 3-5)

Implementation 2016-17

- All materials available in summer 2016
- Summer 2016 will include training from McGraw-Hill publishers for all teachers on use of print and online materials
- Additional technology training from the publisher – fall 2016
- Summer math committee work will include:
  - Alignment of materials with grade level unit plans
  - Development of instructional learning ladders
  - K-8 alignment of common math language - vocabulary, common strategies
  - Examination of supplemental resources to support unit plans
- Ongoing professional development during school year
  - Focus on 8 mathematical practices
  - Supported by CEC/D105 Math Specialists

Measures of Success

- Positive **teacher survey ratings** regarding addition of foundational math resources and the accompanying professional support
- Positive **student survey ratings** regarding level of challenge with math instruction
- **Improved unit assessment** results
- Long term: **improved student performance** on district and state assessments (MAP, PARCC)

NCTM
(National Council of Teachers of Mathematics)

Access for All Students

Research indicates that all students can learn mathematics when they have access to high-quality mathematics instruction and are given sufficient time and support to master a challenging curriculum (Burris, Heubert, & Levin, 2006; Campbell, 1995; Education Trust, 2005; Griffin, Case, & Siegler, 1994; Knapp et al., 1995; Silver & Stein, 1996; Slavin & Lake, 2008; Usiskin, 2007).

"Equity does not mean that every student should receive identical instruction; instead, it demands that reasonable and appropriate accommodations be made as needed to promote access and attainment for all students" (NCTM 2000, p. 12).

NCTM recommends the use of Elementary Mathematics Specialists in pre-K–6 environments to enhance the teaching, learning, and assessing of mathematics to improve student achievement.

NCTM
(National Council of Teachers of Mathematics)

Rigor and Balance

NCTM supports the Common Core State Standards viewing them as the foundation for the development of more rigorous, focused, and coherent mathematics curricula, instruction, and assessments that promotes conceptual understanding and reasoning as well as skill fluency.

Procedural fluency is a critical component of mathematical proficiency. Procedural fluency is the ability to apply procedures accurately, efficiently, and flexibly; to transfer procedures to different problems and contexts; to build or modify procedures from other procedures; and to recognize when one strategy or procedure is more appropriate to apply than another.