Pocantico Hills School
Math Instructional Update
January 24, 2019

Adam Brown, Director of Curriculum and Technology, CIO
Peggy Golden, Consultant
Emma Goodman, 5th Grade Teacher
Michelle Fitzpatrick, 1st Grade Teacher
Personalized Professional Development with Peggy Golden

- August 29  (Superintendent Conference Day)
- October 5  Grades 1, 2, 3, 4
- October 12 Grades PK, K, 5, 6
- November 14 Grades PK, K, 1, 2
- November 15 (weather-shortened) Grades 4, 5, 6
- December 5 (weather make-up) Grade 3
- December 6 Grades 4, 7
- January 10 Grades PK, K, 1, 2
- January 11 Grades 3, 4, 5, 6

1st Semester: In addition to the August Superintendent Conference Day, each grade-level team PK-6 has had at least three personalized 1½-hour sessions
Develop math units of instruction and teacher proficiency in making conceptual connections and designing student-centered lessons

**2017-2018**

Focus: Building Capacity - Middle School Content, Pedagogy, and Instruction
- Build content expertise
- Expand instructional practices
- Design lessons
- Identify anchor problems and develop centers
- Identify opportunities to reorganize scopes and sequences
- Build awareness of Next Generation Mathematics Learning Standards (as per NYSED)

**2018-2019**

Focus: Designing Lessons/Units and Building Capacity - K-8 Content, Pedagogy, and Instruction
- Build content expertise and awareness of conceptual approach in contiguous grades
- Model instructional practices in support of a student-centered model
- Develop curriculum units K-8
- Align instructional practices across grade levels
- Develop formative assessments aligned to the instructional pedagogy and State assessments
- Build capacity around Learning Standards (as per NYSED)

**2019-2020**

Focus: Continuing Lesson/Unit Design, Instructional Coaching, and Capacity Building
- Refine math curriculum units
- Strengthen practice through instructional coaching to support the workshop model and the Singapore methodology
- Build capacity around Learning Standards (as per NYSED)

**SUMMER 2020**

THREE-YEAR BENCHMARK DATA POINT

Large scale review of progress toward long term goals

Adjustment & refinement of priorities

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Adjustment & refinement of priorities
Focus: Designing Lessons/Units and Building Capacity - K-8 Content, Pedagogy, and Instruction

- Build content expertise and awareness of conceptual approach in contiguous grades
- Model instructional practices in support of a student-centered model
- Align instructional practices across grade levels
- Build capacity around Next Generation Learning Standards (as per NYSED)
- Develop curriculum units K-8
- Develop formative assessments aligned to the instructional pedagogy and State assessments

Through the first four months, we have spent the most time focusing on the highlighted action items.
• Teachers analyze how skills and strategies in the Standards evolve and are applied consistently across the grade levels.
  • “Make a Ten” strategy in grades 1-5
Build content expertise and awareness of conceptual approach in contiguous grades

\[
\frac{1}{2} + \frac{5}{8}
\]

“Traditional”

\[
= \frac{3}{2} + \frac{5}{8}
\]

\[
= \frac{12}{8} + \frac{5}{8}
\]

\[
= \frac{17}{8}
\]

\[
= 2 \frac{1}{8}
\]

Make the Next 1

\[
1 \frac{1}{2} + \frac{5}{8} = 2
\]

\[
2 + \frac{1}{8} = 2 \frac{1}{8}
\]
Model instructional practices in support of a student-centered model

- Teachers use the Next Generation Learning Standards to develop differentiated centers that support fluency and conceptual understanding through games, open-ended tasks or word problems, computer programs, or teacher modeling.

- Teams use assessment data analysis to identify misconceptions and determine topics for centers and mini-lessons.

- Teams share logistical strategies for centers with each other and observe colleagues’ classrooms.

- Consultant models instructional strategies that strengthen conceptual understanding.
Teams analyze how a strategy in one grade applies to a different concept in another grade.

Working directly with teachers, the consultant ensures vocabulary, content, and pedagogy are consistent and vertically aligned.

A tape diagram used to solve a Compare problem:
A big penguin will eat 3 times as much fish as a small penguin. The big penguin will eat 420 grams of fish. All together, how much will the two penguins eat?

Big penguin: 

Small penguin: 

\[
\begin{align*}
B &= \text{number of grams the big penguin eats} \\
S &= \text{number of grams the small penguin eats} \\
3 \cdot S &= B \\
3 \cdot 140 &= 420 \\
S &= 140 \\
S + B &= 140 + 420 \\
&= 560
\end{align*}
\]

A variety of representations can be used when applying the properties of operations, which may or may not include parentheses. The area model (NY-3.MD.7c) is a multiplication/division strategy that applies the distributive property (NY-3.OA.5), e.g.,

\[
\begin{align*}
8 \times 7 &= 8 \times (5 + 2) \\
&= (8 \times 5) + (8 \times 2) \\
&= 56 + 16 \\
&= 72
\end{align*}
\]

The area of a \( \frac{3}{4} \) rectangle is \( \frac{3}{4} \) because the whole is partitioned into 12 parts with 6 of them shaded.

Unit Form:

\[
\begin{align*}
20 \times 30 &= 0.2 \times 0.03 \\
= 2 \text{ tens} \times 3 \text{ tens} &= 3 \text{ tenths} \times 3 \text{ hundredths} \\
= 6 \text{ hundreds} &= 6 \text{ thousandths} \\
= 600 &= 0.006
\end{align*}
\]
Teams are actively:

- Taking “deep dives” into the Next Generation Learning Standards at each grade level and coherence charts that bridge grade levels

- Studying the NYSED “Crosswalk” documents to better understand the changes from the Common Core Standards

- Analyzing released NYSED assessment questions for embedded pedagogy “Messages from the Illuminati”

Which expression is equivalent to $60 - 3y - 9$?

A. $3(17 - y)$
B. $3(20 - y) - 3$
C. $17(3 - y)$
D. $20(3 - 3y) - 9$

The model below is shaded to represent an expression.

Which expression represents the model?

A. $\frac{1}{3} \times \frac{2}{5}$
B. $\frac{1}{3} \times \frac{5}{2}$
C. $3 \times \frac{2}{3}$
D. $3 \times \frac{5}{2}$
Teams are actively:

- Applying the Mathematical Practices to lessons and activities

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

- Highlighting curricular alignments and disconnects between our current program, Primary Mathematics, and NYSED’s EngageNY / Eureka Math
Teachers are committed to teaching conceptual understanding of math concepts.
Models are consistent through the grade levels.

The area model is introduced concretely in Kindergarten when students are asked to arrange items in arrays. By Grade 4, the students are using the same model to multiply 2-digit numbers. In Middle School, the students could use the model to multiply variables such as \((x + y)^2\).
Make A Ten: The Strategy through the Grades

Make a Ten eventually becomes a mental math strategy.

Kindergarten
- Foundational Skills
- What are the partners to 10?

Grade 1
- Make a Ten
- Make the Next Ten

Grade 2
- Make a Hundred

Grade 3
- Make the Next Hundred

Grade 4
- Make a One
- Make the Next One
- Common Units (Denominators)

Grade 5
- Make a One
- Make the Next One
- Mixed Units
Math Concepts and Real-World Applications
Comments and Questions – Thank You!