BLENDING Math Instruction for Elementary Grades
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Blending Math Instruction for Elementary Grades

Expert Presenters:

**Jill Thompson**, instructional technology specialist, Bishop Spaugh Professional Development Center, Charlotte-Mecklenburg Schools, N.C.

**Jessica Indelicato**, 4th grade special education teacher, Presidential Park Elementary School, Middletown, N.Y.

**Amy Credeen**, principal, Race to the Top Grant, Enlarged City School District of Middletown, Middletown, N.Y.
An on-demand archive of this webinar will be available at www.edweek.org/go/webinar in less than 24 hrs.
Using Blended Learning to Support Mathematics Instruction

Jessica Indelicato & Amy Creeden
Enlarged City School District of Middletown
February 2014
About the Enlarged City School District of Middletown

Location: Orange County New York
65 miles Northwest of NYC

Schools: 1 High School (Grades 9-12)
        2 Middle Schools (Grades 6-8)
        4 Elementary Schools (Grades K-5)

Enrollment: 7,200 students

Budget: $134 million

20% English Language Learner (ELL)
76% Free/Reduced lunch (FR/R)
51% Hispanic/Latino
29% Black
About Me

- Self-contained Special Education classroom
- 4th grade students
- 15:1 ratio (no teacher’s aide)
- First year teaching in a blended learning environment – opted in to first phase of district-wide implementation (alongside 32 other teachers)
- 1:1 device to student ratio – Google Chrome books
- Teach both Math and ELA in a blended learning environment where students academic levels in both math and ELA range from 2nd grade through 4th grade
**District-wide Vision**
Provide an innovative personalized learning environment that engages and empowers each student to:
- Develop academic proficiency in grade level skills
- Develop the knowledge and essential skills to graduate
- Reach his/her full potential and become a lifelong learner
- Become a competitive, productive member of society

**Cohort Academic Goals**
- **ELA**: 10% increase in number of students scoring level 3 or 4 on district benchmarks
- **Math**: 10% increase in number of students scoring level 3 or 4 on NWEA MAPS assessments

**Blended Learning Priorities**
- Differentiated instruction in all classrooms
- Small group instruction, center and workstation activities in ELA and Mathematics
- Shift from teacher control of learning toward student control of learning

**Key Challenges**
- Classrooms where student in the same grade have proficiency in ELA & math that span across several grades levels (up and down)
- Low reading comprehension across grades
- High numbers of students failing quarterlies in math/ELA
- Weakness in writing: low scores on district rubrics
- Making data-driven instruction routine

**Key Strengths**
- Staff works cohesively & teacher collaboration with literacy coaches, technology & math Teachers on Special Assignment (TOSA)is high
- Use of nonfiction texts and integration of technology in the classroom
- Regular review of formative assessment data. Availability of data from MAPS, quarterlies, and benchmarks

**Our District Blended Learning Priorities Framework**
Most teachers expressed a preference for 20-minute rotations; however, it may be necessary to shorten or lengthen rotations in order to make full use of digital content.

Timing and sequence of rotations during 60-minute blocks may vary depending on teacher needs. Digital content blocks can be structured to fill 15, 20, 30, or 40 minutes depending on number of groups.

Closing to class may include some type of assessment in order to collect data to drive following days’ instruction.
How Stations Map to Pedagogy

Each station is best suited to address different learning levels of Bloom’s Taxonomy.

Project & Group Learning
- Critical thinking
- Evaluating concepts

Small Group Instruction
- Higher order thinking skills
- Differentiated mini-lessons

Individualized Content
- Adaptive & engaging content
- Embedded assessments & data

Bloom's Taxonomy
- Creating
- Evaluating
- Analyzing
- Applying
- Understanding
- Remembering

Source: Education Elements
## Guided Math Strategies and Rotation Models

<table>
<thead>
<tr>
<th>Structure of Math Workshop</th>
<th>Traditional Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Math Routine &amp; Mini Lesson</td>
<td>Whole Class</td>
</tr>
<tr>
<td>Small Guided Groups</td>
<td>Small homogenous groups</td>
</tr>
<tr>
<td>Closing</td>
<td>Whole Class</td>
</tr>
</tbody>
</table>

- **Math stretch, problem of the day, daily data activity including debrief w/students & direct instruction of targeted concepts**
- **Utilization of learned strategies in new application w/guidance by teacher**
- **Independent problem solving using digital content**
- **Extended problem solving in collaborative groups: multi-step, writing in math, real life application problems**
- **Reinforce key concepts, review learning goals, preview next day material**
My Model: Daily Routine

“3:20” Rotation

At the start of each day, students utilize their interactive notebooks to rate themselves on a scale of 1-4 on the stated objective. This is followed by a whole-group mini-lesson. Following the mini-lesson students are immersed in problem solving. The daily word problem is threaded to the objective. Scaffolding is in place to meet each learner's needs.

The instructional block ends with a check and reflect. Students are given opportunities to share their thinking and explain how they answered the word problem. Students are heterogeneously grouped (low/high) so that all students are exposed to mathematical thinking and vocabulary at varying levels. The check and reflect ends with an opportunity for students to re-evaluate themselves within their interactive notebook.
<table>
<thead>
<tr>
<th>Score</th>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>[Sad Emoji]</td>
<td>I do not know much about this topic.</td>
</tr>
<tr>
<td>2</td>
<td>[Neutral Emoji]</td>
<td>I know a little about this topic.</td>
</tr>
<tr>
<td>3</td>
<td>[Happy Emoji]</td>
<td>I know a lot about this topic.</td>
</tr>
<tr>
<td>4</td>
<td>[Very Happy Emoji]</td>
<td>I know a lot about this topic and I can explain it to a partner in my own words.</td>
</tr>
</tbody>
</table>
My Model: Rotation Order

“3:20” Rotation

My lowest performers always start with me and end with digital content. This group remains fairly static due to the fact that academically, they are so low, requiring so much support.

My “middle” and “high” groups are more fluid in terms of who is in which group (I re-adjust every 2 weeks or so based on skill strength and weakness - determined by multiple data measures). They start with independent learning or a collaboration activity.
Managing Transitions Between Rotations

2X to signal students should prepare to move (1X is not enough because some students have earbuds in at independent station) around 1 minute before transition

2X, followed by students also clapping 2X, and then students move to the next station

Look at the schedule posted to know where to go next

Signal the end of class and moving back to whole group instruction
Collaborative Work (C.W.):
Solve. I should hear you talking it out with a partner.

Find the perimeter and area of each rectangle below:

- The table in our classroom is 6 feet by 4 feet. What is the perimeter and area of the table?

- Mr. Indelicato is building a fence for our backyard. The backyard measures 25 yards by 9 yards. He purchased 210 yards of fencing material. Does he have enough fencing material to build the entire fence?
Hardware / Software

Chromebooks
Math vs. ELA

• Math is very skill specific. As a result, it is easier to break the skill down to remediate and/or provide extension.

• Students find it easier to connect what they are learning on the computers to other activities in math than in ELA

• Otherwise, no major differences. Students are succeeding in both
Support: An Important Key to Success

• Collaboration throughout all phases of design and implementation

• Professional Development during the summer was necessary and impactful – Education Elements worked with teachers and leaders to get them prepared

• Not enough to just have new tools – need people to help. District provided tech Teachers on Special Assignment (TOSA) which have been invaluable

• You need people to talk to – it’s important to have a critical mass of other teachers who can help support your efforts
Tips and Strategies (1/2)

- Emphasize **structure**
  - Organize your classroom
  - Develop routines
  - Use visuals for rotations

- Set **clear expectations**, from the **beginning**
  - Model the behavior you want to see (e.g. pack up after chimes, move after claps)
  - Practice how to transition
  - Remind students what they are expected to do
  - Continually monitor student progress
  - Strategically choose content that the students are working within
  - Know the digital content strengths and weaknesses
Tips and Strategies (2/2)

- Be **flexible**
  - Recognize that it is sometimes difficult for every rotation to get the fully allotted time
  - Have plans for how you can “make up minutes”

- Be **patient**
  - It takes time for students to know the routines but keep trying – they, and you, will get there
  - The outcomes are worth the wait
Impact

✓ I am more structured about my lessons

✓ I get equal time with each group (rather than over-spending time with the lower performing group)

✓ I use data more frequently and effectively to personalize learning (Look at data on the Education Elements platform regularly to re-group students and understand gaps)

✓ I am more confident about choices I am making around how to meet the needs of my students (more strategic placement within content)

✓ I can more clearly see the progress my students make. It may be incremental but I can watch it happen

✓ My students are more aware of what their goals are and how to meet them

✓ My students are learning more, at a faster rate and not losing depth of knowledge

✓ Helping to fill in the gaps with regard to previous content and skills
Mistakes are proof that you are trying.
What do the kids say about blended learning?

"I love using the Chromebooks because they teach me new stuff and make me feel smart."

"I like to use the Chromebooks because on iReady it helped me skipcount by 3's. Skipcounting helps me go so much faster when I multiply."

"I like the Chromebooks because they help me with math and reading. They make math and reading fun!"

"I like the Chromebook because with iReady, Dreambox and Lexia it knows what I need practice with."

“iReady math helps me with shapes and numbers. It is so, so, so, so awesome because it helps me a lot!"
DreamBox Combines Three Essential Elements to Accelerate Student Learning

Rigorous Elementary Mathematics
- Common Core State Standards
- Standards for Mathematical Practice

Motivating Learning Environment
- Student directed, empowering
- Gaming fundamentals, rewards

Intelligent Adaptive Learning™ Engine
- Millions of individualized learning paths
- Tailored to a student’s unique needs
Blended Math Instruction for Elementary Grades

Jill Thompson
jill.thompson@cms.k12.nc.us
About Me: Jill Thompson

• In Education for 10 Years
  – 5th grade teacher
  – Math and Science Facilitator
  – Instructional Technology Specialist & Project Manager for Personalized Learning
  – ASCD Emerging Leader
  – Edulum LLC

• Social Media
  – @edu_thompson & @CMS_JillT
  – Blog
  – Website
Charlotte –Mecklenburg Schools Fast Facts

- Charlotte, North Carolina
- Superintendent- Dr. Morrison
- Student Population: 141,000+
- 9,500+ Teachers
- 160 Schools
  - 54.3% of students who qualify for Free or Reduced Lunch
  - 10% of students designated English Language Learners
  - 10% of students with Special Needs
  - Graduation rate 81% in 2013
Flipped Classroom Model

The Traditional Classroom
Teacher’s Role: Sage on the Stage

- LECTURE TODAY
- Homework: Reading and questions due tomorrow

The Flipped Classroom
Teacher’s Role: Guide on the Side

- ACTIVITY TODAY
- WATCH lecture online tonight
My Journey
Integrated Google’s 80/20 theory (Now in Edu= Genius Hour)

Fridays PBL became more student centered
Using the Math Data to Drive the Blended Learning

Name ________________________________
Block __________
Homeroom Teacher ____________________________

Number & Operations in Base Ten Unit Post-Assessment

1. How is one hundred fifty-two thousand, six hundred six and 31 hundredths written in standard form? (5.NBT.2)

5. Which would be smaller, a number with a 9 eight in the thousandths place or a number with a nine in the thousandths place? Explain. (5.NBT.3)
Strategies for Blended Learning in the Math Classroom

Screens Facing You

Student Ownership

QR Codes
Curriculum For Blended Learning in Math

Websites:

- Khan Academy
- OpenEd
- Sophia.org
- Ted Ed
- Learn Zillion
- DreamBox
- Edmodo/Gaggle
- Blendspaces

Apps

- ShowMe/Educreation
- Knowmia
- Explain Everything

Google Apps For Education

- Drive
- You Tube
Supporting Math Coaches and Classroom Teachers with Blended Learning

- Professional Development (TPACK, SMAR)
- Reflection and Mentor
- Flexible & Agile
- Innovate Time
- Model Lessons and Visit Classrooms

Supporting Math Coaches and Classroom Teachers with Blended Learning
Getting ‘Late’ Adopters on Board

- Show how it benefits them
- Make them feel comfortable
- Offer differentiated PD
- Embrace the power of one
- Activate peer pressure
- Yea But Activity
- Have patience
- Go the extra mile
Other Great Resources for Blended Learning

- **Twitter Hashtags**
  - #blendedlearning
  - #21stedchat (Sun @ 8pm)
  - BYOTchat (Thur @ 8pm)

- **Web Sites:**
  - Education Week
  - Clay Christensen
  - Getting Smart

- **Book:**
  - The World School House: Education Reimagined by Salman Khan
DreamBox Combines Three Essential Elements to Accelerate Student Learning

**Rigorous Elementary Mathematics**
- Common Core State Standards
- Standards for Mathematical Practice

**Motivating Learning Environment**
- Student directed, empowering
- Gaming fundamentals, rewards

**Intelligent Adaptive Learning™ Engine**
- Millions of individualized learning paths
- Tailored to a student’s unique needs
Intelligently adapt & individualize to:

- Students’ own intuitive strategies
- Kinds of mistakes
- Efficiency of strategy
- Scaffolding needed
- Response time
Why is DreamBox so Effective?
Integrated Assessment and Instruction

Students who demonstrate understanding of this concept skip the unit and move to a new skill assessment.

Students who don’t have these skills work through a unique sequence of lessons in the unit to learn these concepts.
## Classroom Summary Report

| Student       | Grade | Kindergarten Curriculum | 1st Grade Curriculum | 2nd Grade Curriculum | 3rd Grade Curriculum | Time on Task (HH:MM) | Notifications | Student Reports |
|---------------|-------|-------------------------|----------------------|----------------------|----------------------|----------------------|---------------|----------------|----------------|
| Alexander F   | 1     |                         |                      |                      |                      | 17:55                |              | Weekly Detail |
| Alexi K       | 1     |                         |                      |                      |                      | 14:04                |              | Weekly Detail |
| Billy R       | 1     |                         |                      |                      |                      | 14:14                |              | Weekly Detail |
| Brianna S     | 1     |                         |                      |                      |                      | 51:43                |              | Weekly Detail |
| Cassandra H   | 1     |                         |                      |                      |                      | 18:02                |              | Weekly Detail |
| Erinne N      | 1     |                         |                      |                      |                      | 20:42                |              | Weekly Detail |
| Jayce D       | 1     |                         |                      |                      |                      | 28:13                |              | Weekly Detail |
| Josephine J   | 1     |                         |                      |                      |                      | 15:59                |              | Weekly Detail |
| Kevin M       | 1     |                         |                      |                      |                      | 18:18                |              | Weekly Detail |
| Kylee P       | K     |                         |                      |                      |                      | 10:24                |              | Weekly Detail |
| Linda C       | 1     |                         |                      |                      |                      | 36:10                |              | Weekly Detail |
| Marianne I    | 1     |                         |                      |                      |                      | 15:58                |              | Weekly Detail |
| Mario E       | 1     |                         |                      |                      |                      | 23:44                |              | Weekly Detail |
| Michael B     | 1     |                         |                      |                      |                      | 28:40                |              | Weekly Detail |
| Ramona G      | 1     |                         |                      |                      |                      | 11:00                |              | Weekly Detail |
| Renee Q       | 1     |                         |                      |                      |                      | 11:02                |              | Weekly Detail |
| Rilee L       | 1     |                         |                      |                      |                      | 13:18                |              | Weekly Detail |
| Roberta A     | 1     |                         |                      |                      |                      | 21:04                |              | Weekly Detail |
| Sakurah P     | 1     |                         |                      |                      |                      | 00:16                |              | Weekly Detail |
| Solomon O     | 1     |                         |                      |                      |                      | 09:57                |              | Weekly Detail |
## Strong Support for Differentiation

### Concept: Multiplication: Double & Halve

Students use known basic facts and double one factor and halve the other to determine the product of a more challenging problem.

<table>
<thead>
<tr>
<th># Completed with Proficiency</th>
<th># In Progress</th>
<th># Not Started</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 students</td>
<td>10 students</td>
<td>9 students</td>
</tr>
<tr>
<td>John P (about 1 month ago)</td>
<td>Avaneesh S (71%)</td>
<td>Anthony P</td>
</tr>
<tr>
<td>Jacob C (about 1 month ago)</td>
<td>Charles K (71%)</td>
<td>Brittany B</td>
</tr>
<tr>
<td>Rebecah D (about 1 month ago)</td>
<td>Emmanuel M (71%)</td>
<td>Christina P</td>
</tr>
<tr>
<td>Julian B (about 1 month ago)</td>
<td>Luke R (71%)</td>
<td>Emily C</td>
</tr>
<tr>
<td>Edgar H (about 1 month ago)</td>
<td>Alanna M (64%)</td>
<td>Karly H</td>
</tr>
<tr>
<td>Pedro S (2 months ago)</td>
<td>Domenic G (64%)</td>
<td>Leah P</td>
</tr>
<tr>
<td>Daniel C (3 months ago)</td>
<td>Daniel S (57%)</td>
<td>Michael D</td>
</tr>
<tr>
<td></td>
<td>Dominique S (28%)</td>
<td>Samantha S</td>
</tr>
<tr>
<td></td>
<td>Suna C (28%)</td>
<td>Vanessa C</td>
</tr>
<tr>
<td></td>
<td>Caitlin S (21%)</td>
<td></td>
</tr>
</tbody>
</table>
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Required Reading from *Education Week*:

**Special Report: Sizing Up Blended Learning**
This special report is the latest installment in an *ongoing series about online education*. These stories examine the opportunities and persistent questions that surround schools' and districts' implementation of blended learning, the widely used instructional approach that combines technology-based instruction with traditional, face-to-face lessons.

**Spotlight on Blended Learning**
**Free download**: In this Spotlight, hear from teachers who are using blended learning; take a look at how school buildings are being re-designed to support personalized learning; and discover how augmented reality and mobile apps are helping to transform class field trips.