Foundations in Mathematics: Promoting Good Beginnings

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Kindergarten Readiness
Early Mathematics Skills

• Subitize 1-5 objects
• Understand the phrase “How Many?”
• Adds 1-3 objects together
• Knows basic 3-D shapes handout
• Uses shapes to create pictures
• Uses comparison terms “more” “less” “heavy” “long”
• Notices and copies simple patterns with shapes, sounds, letters
• Sorts objects and counts and compares the groups formed
What mathematics’ does a third grade student need to have mastered in order be well prepared for college?
Overview of the Learning Progression to Post-Secondary Mathematics

<table>
<thead>
<tr>
<th>K</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>HS</th>
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<tbody>
<tr>
<td>Counting &amp; Cardinality</td>
<td>Number and Operations in Base Ten</td>
<td>Ratios and Proportional Relationships</td>
<td>Number &amp; Quantity</td>
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<td>Number and Operations – Fractions</td>
<td>The Number System</td>
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<td>Operations and Algebraic Thinking</td>
<td>Expressions and Equations</td>
<td>Algebra</td>
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<td>Functions</td>
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<td>Geometry</td>
<td>Functions</td>
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<td>Measurement and Data</td>
<td>Statistics and Probability</td>
<td>Statistics &amp; Probability</td>
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Mathematics Learning Trajectory: Early Concepts to Advanced

Turnonccmath.net
What factors contribute to students attaining mathematics proficiency?
“Very few studies link early childhood, elementary, and middle school characteristics to post-secondary success.” — College & Career Readiness & Success Center at American Institutes for Research
Preschool attendance is among the strongest factors of elementary school preparedness. In 2000, Taylor, Gibbs, and Slate examined the scores of 171 students (81 students who had attended preschool and 90 students who had not attended preschool) on the Georgia Kindergarten Assessment Program (GKAP). “Students who had attended preschool demonstrated statistically higher overall school readiness, higher Physical scores, and higher Personal scores than students who did not attend preschool. No difference, however, was found in GKAP scores as a function of type of preschool attended.”

During the nine months of the school year, socioeconomically disadvantaged students make achievement gains similar to their more advantaged peers. Yet, during the two summer months, lower-income students fall behind while their wealthier peers make slight gains. The cumulative affect of the summer learning loss significantly contributes to the achievement gap between lower-income high school students and their and middle-class and high-income peers (Leefatt, 2015).

“A growing body of evidence indicates that effects of poverty on physiologic and neurobiologic development are likely central to poverty-related gaps in academic achievement” (Blair & Raver, 2016, p. 1).

Research by Bodovski and Youn (2010) found that “parental depression, measured in kindergarten, was associated with lower and math achievement and lower approaches to learning at the grade. Use of physical discipline in kindergarten was associated 5th-grade math achievement” (p. 585).


Chronic Absenteeism

Attendance strongly affects achievement scores. Mathematics scores are especially sensitive to absenteeism. Poor attendance also wreaks havoc on high school graduation and dropout rates.

Reasons reported why students do not attend schools include:

• unable to attend due illness, family responsibility, and detainment by the juvenile justice system
• to avoid bullying, unsafe conditions, harassment, and embarrassment; and
• failure to do not see the value in being in school

What can educators and community members do?

- Recognition during morning announcements
- Certificate/award at student assembly
- Breakfast/lunch with the principal, superintendent, school board president, mayor, etc.
- School supplies (e.g. pencil with logo)
- Food coupons redeemable in school cafeteria
- Food gift certificates for McDonald's, Wendy's, etc.
- Ice cream/pizza party for class with best attendance
- "School money" for the school store
- Choice of donated product (movie, tickets, gift certificate)
- Traveling trophy for grade-level homeroom with best monthly attendance
- Attendance T-shirts/hats/buttons

Source: Nevi/ York State Department of Education Student Support Services

How is UWG supporting Carroll County Elementary Students’ achievement in Math and Literacy?
How is UWG supporting Carroll County Elementary Students’ achievement in Math and Literacy?
The Math Lab

- 1-on-1 Tutoring Services
- Kindergarten-6th
- Services provided by Senior Early Childhood Ed/Special Ed Majors
- Modified Field-Placement
- 1 academic credit hour
- 1 hour session per week/10 weeks
## Candidates/Services/Clients

<table>
<thead>
<tr>
<th>Summer 2013 – Spring 2014</th>
<th>Clients</th>
<th>Candidates (graduate students)</th>
<th>Observers (undergraduate students)</th>
<th>Tutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech &amp; Language</td>
<td>142</td>
<td>33</td>
<td>123</td>
<td></td>
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<tr>
<td>Reading</td>
<td>89</td>
<td></td>
<td></td>
<td>94</td>
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<tr>
<td>Math</td>
<td>80</td>
<td></td>
<td></td>
<td>92</td>
</tr>
<tr>
<td>Counseling Consultations</td>
<td>20</td>
<td>3</td>
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<tr>
<td><strong>Totals Served</strong></td>
<td><strong>Clients</strong></td>
<td><strong>Students</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>331</strong></td>
<td><strong>345</strong></td>
<td></td>
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</tr>
</tbody>
</table>
The Literacy Lab

- Provides Assessment and Instructional Services
- Reading and Writing
- Students, grades K-12
- Services provided by Senior Early Childhood Ed majors
- Modified Field-Placement
Is “Math Lab” Making a Difference?

### Basic Facts Fluency (1-12)

<table>
<thead>
<tr>
<th>Operation</th>
<th>Average Gain</th>
<th>Range</th>
<th>Median Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ (n=8)</td>
<td>22%</td>
<td>6% - 44%</td>
<td>18%</td>
</tr>
<tr>
<td>- (n=6)</td>
<td>15%</td>
<td>5% - 30%</td>
<td>15%</td>
</tr>
<tr>
<td>X (n=7)</td>
<td>35%</td>
<td>3% - 60%</td>
<td>35%</td>
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</table>

Fall Semester 2014
Is “Math Lab” Making a Difference?

<table>
<thead>
<tr>
<th>Operation</th>
<th>Average Gain</th>
<th>Range</th>
<th>Median Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ (n=5)</td>
<td>38%</td>
<td>*0% - 68%</td>
<td>50%</td>
</tr>
<tr>
<td>− (n=6)</td>
<td>51%</td>
<td>*0% - 100%</td>
<td>51%</td>
</tr>
<tr>
<td>× (n=10)</td>
<td>40%</td>
<td>8% - 90%</td>
<td>33%</td>
</tr>
<tr>
<td>Early Number Concepts (n=4)</td>
<td>51%</td>
<td>20% - 100%</td>
<td>42.5%</td>
</tr>
</tbody>
</table>

*Second goal for client
Extending to Off-Site Locations:

- 2 Title I Elementary Schools
- 1 Title I Charter (K-6) School
- 1 Title I Middle School
- Established Field Placement Schools with MOU’s in place
- Parent/Guardian Signed Consent Form
- Serve as *After –School Program Math Tutors*
  - 40 - 45 minute sessions with 1 student
    (no group tutoring)
  - UWG Faculty Supervisor visits 2-3 times per semester