



RSU #38 Math Data

A Deeper Dive into 2019/2020 Math Data

Nancy: Intro Abby Shink has prepared a short report responding to your two questions re: **math achievement** and **deeper analysis of scores**. **THEN** we'd welcome your comments and questions.



Overview of Math Data

- NWEA
- MEA
- Benchmark Assessments

Looking at multiple data points is best practice

At the last curriculum committee meeting, we were asked to take a closer look at the math achievement data in our district. We did this by pulling in other testing measures that could help to give us a more complete picture of our students' achievement. We have a variety of data points that we can look at, at any given time. When looking for trends in data, it is helpful to look at multiple data points in different ways. We can look longitudinally or over time, or we can look across grade spans to identify trends and draw conclusions. In an effort to look more deeply into the question regarding **whether or not we are seeing a dip in our students achievement in math**, we felt like it was important to **look at multiple data points, through a variety of lenses**. This mirrors the way that we use this data in our district to monitor growth, reflect on teaching practices, and to help us make decisions about programming and intervention for students. To do this deeper dive, we looked at data K-10, though we dug deeper into a few grade spans due to the availability of the greatest number of data points to compare.

Comparison: 2020 Winter NWEA to 2019 MEA Gr. 4-6

Grade 4

2020 Winter NWEA		Lo %ile<21	LoAvg %ile 21-40	Avg %ile 41-60	HiAvg %ile 61-80	Hi %ile >80					
Total	83	19	23%	30	36%	17	20%	11	13%	7	8%
		Well Below State Expectations		Below State Expectations		At State Expectations		Above State Expectations			
2019 MEA			17%		45%		35%				4%

Grade 5

2020 Winter NWEA		Lo %ile<21	LoAvg %ile 21-40	Avg %ile 41-60	HiAvg %ile 61-80	Hi %ile >80					
Total	86	20	23%	28	33%	21	24%	11	13%	6	7%
2019 MEA		Well Below State Expectations		Below State Expectations		At State Expectations		Above State Expectations			
Total			17%		53%		26%				3%

Grade 6

2020 Winter NWEA		Lo %ile<21	LoAvg %ile 21-40	Avg %ile 41-60	HiAvg %ile 61-80	Hi %ile >					
Total	92	20	22%	34	37%	19	21%	11	12%	8	9%
2019 MEA		Well Below State Expectations		Below State Expectations		At State Expectations		Above State Expectations			
			18%		52%		24%				6%

This chart compares 2020 winter NWEA data to the data from the same cohort of students from the 2019 MEA testing period. When we look at these two sets of data side by side, we can notice things like:

- **The percentages of students are similar, leading us to believe that the NWEA is a decent predictor of how students will perform on the MEA.**
- Interesting to note that the **students placing in the Average to HI Average range on the NWEA and the percentage of students meeting state expectations are similar** when comparing the two sets of data.

Limitations of this comparative analysis comparing this data:

- the norms set by the NWEA are based on a study done with 72,000-153,000 student tests from across the country, in contrast to the MEA which is based on averages created within our State.
- While we can dig deeper to get an idea about areas of math in which our students are scoring higher or lower on the MEA, we can only surmise that the types of questions they may be struggling with (Multiple choice vs. open response) might account for differences in scores for any individual student/



Synthesizing Trends

Trends across NWEA and MEA data points

- Fewer students High Performing on MEA than NWEA 4-6

Grade	Above State Expectations MEA	High NWEA
4	4%	8%
5	3%	7%
6	6%	9%

We can look at different subgroups within the data, looking at **high achieving students we notice that there are fewer students that are high performing on the MEA than there are on the NWEA in grades 4-6**. This may be due to the difference between two tests. The MEA is a performance based test, requiring students to perform more application of skills and concepts than the NWEA which is all multiple choice.

MEA (eMPowerME) Scoring Rubric

4: Above State Expectations

The student's work demonstrates a thorough understanding of, and ability to apply the mathematics knowledge and skills needed for achievement relative to the grade level Math Content and Practice Standards. The student solves problems that call for a range of strategies, accurate and insightful reasoning, and connecting different areas of mathematics.

3: At State Expectations

The student's work demonstrates an adequate understanding of, and ability to apply the mathematics knowledge and skills needed for achievement relative to the grade level Math Content and Practice Standards. The student solves problems that call for effective use of strategies and accurate reasoning in different areas of mathematics.

2: Below State Expectations

The student's work demonstrates an incomplete understanding of, and ability to apply the mathematics knowledge and skills needed for achievement relative to the grade level Math Content and Practice Standards. The student solves problems that call for simple strategies and reasoning accurately applied to basic areas of mathematics.

1: Well Below State Expectations

The student's work demonstrates a minimal understanding of, and ability to apply the mathematics knowledge and skills needed for achievement relative to the grade level Math Content and Practice Standards. The student solves some problems that require applying simple strategies to basic areas of mathematics without an understanding of the reasoning behind the strategies.

FMI: See MEA scoring rubric - provided as hand-out (currently state test for gr 3-8 is called eMPowerME - but we just refer to it as MEA so people know what we are talking about).



Synthesizing Trends

Trends across two years in Goal Performance areas

K-5

Operations & Algebraic Thinking
Number & Operations
Measurement & Data
Geometry

6-12

Operations & Algebraic Thinking
The Real and Complex Number
Systems
Geometry
Statistics & Probability

- Identify [Strengths and Needs](#)

In order to learn more about **what areas in math specifically our students may be struggling with, tools provided by the NWEA allow teachers to more readily dig deeper.** It breaks performance out by **goal performance areas which align with the standards we teach in math K-12.** These standards shift in grade 6, which is why we see two sets of goal performance areas. Looking at district data from the last two years, we have been able to identify relative strengths and weaknesses that may help us to consider areas in which we may need to focus more time and energy both in the professional development we provide for teachers, and in curriculum development. We can also look at benchmark assessments to see if that data confirms or denies the trends we see. This year is difficult due to the school closure, many benchmark assessments were not completed, and standards that would have been reassessed or assessed more fully, were not. Certainly the benchmark assessments give us in a typical school year the most detailed picture of what students understand and are able to do in each goal performance area.

When looking at the Strengths and Needs Chart:

These strengths and needs are relative, in that they were determined by comparing scores in those specific goal performance areas to the mean RIT score for the grade level. I have outlined within each goal performance area the types of skills or concepts as identified by the NWEA that are contained in that area. Looking at the data this way can help us to reflect on the areas we have been focused on, and to think about the areas we may need to work harder at with students. Teachers are able to do this analysis with their classes as well to help think think about how this data can inform the instruction within their classroom.



NWEA in our District

Use as one data point when looking for trends

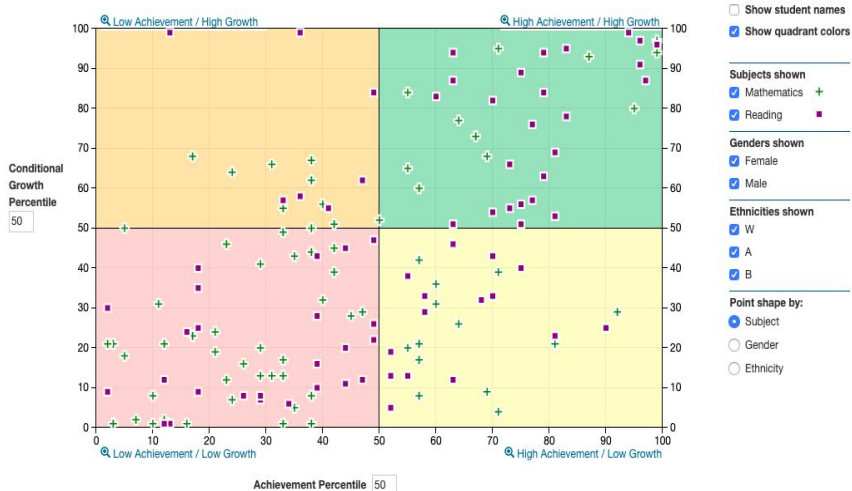
- Longitudinally (over time)
- Vertically (across grade levels)

To address the second question raised by the board, regarding the **usefulness of NWEA going forward**, I want to outline the **ways we currently use the NWEA** to inform this discussion.

We use the **NWEA at every level, classroom, school wide, and district wide, to look at student growth longitudinally (over time, often comparing year to year scores and comparing actual growth to expected growth) and vertically (across grade levels)**. Previously as an interventionist and this year as a coach, I have done this with individual teachers, with groups of teachers, with the math interventionists, and with school based groups including principals, teachers and interventionists to help us consider what progress students are making.

NWEA in our District

Supports reflection on classroom instruction



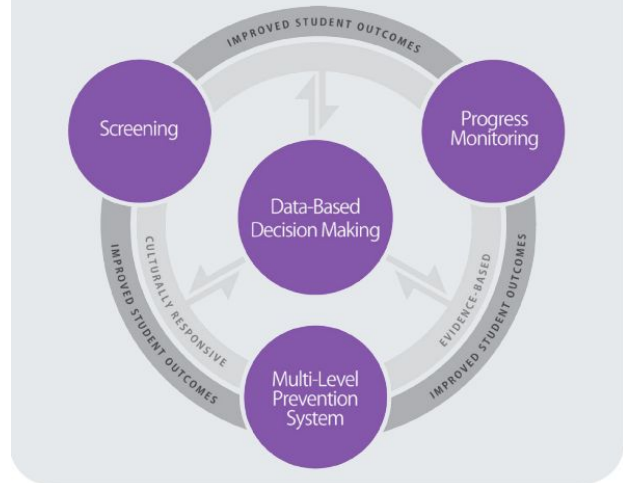
Using the NWEA reports, we can also **zoom in on individual classes to see which groups of students are making adequate progress**. I have used this four quadrant chart frequently over the last two years with administrators, teachers, and interventionists to help inform conversations about which groups are making the most progress and why. This chart plots students based on **ACHIEVEMENT (Horizontal axis) AND GROWTH (Vertical axis) to see what category they fall in: high achievement/high growth (blue), low achievement/high growth (melon), low achievement/low growth (lavender), and high achievement/low growth (pale pink)**. Some questions that might come up in those conversations sound like:

- What is in place for students that are in the low achievement/high growth quadrant? Those supports seem to be working.
- Are the students that are in the high achievement/ low growth quadrant receiving the extension that they need? They don't seem to be making the progress we would like to see?
- Are students in the low achievement/low growth quadrant receiving services of some sort? Do we need to revisit the level of services the currently receive? Are there students in that quadrant that haven't come up in our Rtl conversations that we need to talk about now?


NWEA in our District

Universal Screener for RtI

EXHIBIT 1. ESSENTIAL COMPONENTS OF RTI



The NWEA also is **THE universal screener** in our district. I have been involved in work around the RtI structure at every level K-12 this year, and having a universal screener at each of those levels is critical. It is a tool that we are able to use as a first tier of assessment, it helps us **to identify students that MAY be in need of additional support or extension**. We can then gather further information about them to make important decisions regarding programming. The NWEA, as a universal screener, also acts as one of several criteria the high school uses to determine placement in HS courses for incoming freshmen, as well as for students accelerated to HS courses from the MS.



"Authentic student achievement cannot be measured just by test scores but also by the small day to day moments of each student's individual triumphs."

Robert John Mehan

Taking the time to dig into all of these data points, the NWEA, MEA, Benchmark assessments, as well as others, is an important way to inform conversations we have around teaching and learning in our district. I am thankful to work in a district that sees clearly the importance of looking at multiple data points, and takes the time to understand the limitations of these measures. I know in my work as a teacher and with teachers that the best data we can derive about student achievement is from our work directly with students in the classroom, and **while that is hard to present to you here, I hope that you leave understanding what role that plays for us and the teachers in our district.**