Identifying and Overcoming Relative Weaknesses using NWEA's MAP Assessments and Descartes

By Derek Ippensen

Presented at NAESP and NSASSP Principal's Conference
December 13, 2013

Identifying and Overcoming Relative Weaknesses

In 2001, President George W. Bush signed into law the reauthorization of the Elementary and Secondary Education Act, or the No Child Left Behind Act. Just as it was then, now – twelve years later, leaving any child behind is not good enough. We need to help each child rise to and achieve his or her potential, and that can be accomplished by the identification and overcoming of relative weaknesses.

In this session, Derek Ippensen will discuss how NWEA's MAP assessments and Descartes can be used to identify areas of relative weakness in a student's knowledge, and direct the differentiated instruction process to overcome those areas of relative weakness.

NWEA's MAP Assessments and Descartes

The Northwest Evaluation Association's MAP assessments and Descartes are a complete package that will help identify and specify the relative weaknesses of individual students.

NWEA: Northwest Evaluation Association has been providing computer-based adaptive assessments since 1985.

MAP Assessments: The tool they use today to measure student's growth and progress is the Measure of Academic Progress, or MAP, assessment tool. The MAP assessments are Common Core and Nebraska State Standards aligned, and as such provide a tool to measure where students are currently, and compare that to where they need to be.

NWEA's MAP Assessments and Descartes

Reading: Use Main Ideas and Supporting Details, Strategies to Read Words and Increase Vocabulary, Infer, Draw Conclusions and Predict, Identify Characteristics and Features of Text, and Identify Bias, Purpose, Text Elements and Devices;

Math: Number Sense, Algebraic Concepts, Geometry and Measurement, and Data Analysis and Probability;

Science: Physical Science, Life Science, and Earth and Space Science; and

Language Usage: Apply the Writing Process, Compose Sentences: Develop Coherent Paragraphs, Use Conventions Appropriate for Grade Level, and Write Genres Considering Purpose and Organization.

School: Shickley Public Jr/Sr School
Grade:
Reading Survey w/ Goals 6+ NE V4

Student ID	Name	Grd	Test Type	Test Date	Term	RIT	Std Err	RIT Rng	%ile	%ile Rng	Lexile® Rng	Goal Performance: Read Words / Vocabulary	Main Idea / Details	Infer / Predict	Text Features / Characteristics	Bias / Purpose / Text Elements
			S/G	Sep 11	FA13	249	4.5	245-254	93	89-95	1383-1533	248-271	246-272	248-276	232-257	224-242

NWEA's MAP Assessments and Descartes

Descartes: Descartes is a reference guide designed to show the skills and abilities of students in the assessed subject areas.

Each subject area is composed of goal strands, which are then categorized in 10-point RIT score ranges, which is an accurate, equal interval scale. For each goal strand, at each RIT score range, three sections are provided:

- Skills and Concepts to Enhance,
- Skills and Concepts to Develop, and
- Skills and Concepts to Introduce.

Within each of these categories, are subcategories, including new vocabulary and new signs and symbols.

NWEA's MAP Assessments and Descartes

Subject: Mathematics
Goal Strand: Number Sense
RIT Score Range: 201 - 210

Skills and Concepts to Enhance 191 - 200	Skills and Concepts to Develop 201 - 210	Skills and Concepts to Introduce 211 - 220
Number System	**Number System**	**Number System**
• Identifies whole numbers 100 - 999 using base-10 blocks* • Identifies whole numbers over 999 using base-10 blocks* • Identifies the numeral and written name for whole numbers with a zero between digits to the ten thousands place • Identifies the numeral and written name for whole numbers 10,000 to 100,000 • Identifies the numeral and written name for whole numbers over 100,000 • Identifies the numeral and written name for ordinal numbers 21st to 100th (e.g., 21st is twenty-first, and vice versa)* • Writes equivalent forms of whole numbers 11 to 20 using addition (e.g., 14 = 7 + 7)* • Compares whole numbers through 999,999 • Orders whole numbers less than 1000* • Orders whole numbers less than 10,000 • Rounds 2- and 3- digit whole numbers to the nearest ten • Rounds 3-digit whole numbers to the nearest hundred • Identifies whole numbers under 100 given place value terms (e.g., 3 tens and 4 ones = 34) • Writes whole numbers in standard and expanded form through the hundreds • Writes whole numbers in standard and expanded form through the thousands • Represents 1/3 with a diagram or model • Identifies one-half from a region or set* • Identifies 1/4 from a region or set • Identifies 1/3 from a region or set • Identifies 2/3 or 3/3 from a region or set* • Identifies tenths from a region or set* • Identifies a fraction (denominators other than 2, 3, 4, 8, 10) from a region or set	• Identifies whole numbers over 999 using base-10 blocks* • Identifies the numeral and written name for whole numbers with a zero between digits to the ten thousands place • Identifies the numeral and written name for whole numbers over 100,000 • Identifies a whole number that comes before and/or after a given number (over 100)* • Compares whole numbers through 999,999 • Orders whole numbers less than 10,000 • Orders whole numbers a million or greater • Rounds 4-, 5-, and 6-digit whole numbers to the nearest ten • Rounds 4-, 5-, and 6-digit whole numbers to the nearest hundred • Rounds 4-, 5-, and 6-digit whole numbers to the nearest thousand • Rounds whole numbers to the nearest hundred thousand • Writes equivalent forms of whole numbers using place value (e.g., 54 = 4 tens and 14 ones) • Writes whole numbers in standard and expanded form through the hundred thousands • Identifies halves of a region using nonadjacent parts • Converts a basic fractional numeral to lowest terms (e.g., halves, thirds, quarters)* • Writes mixed numbers as improper fractions and improper fractions as mixed numbers • Compares fractions (e.g., common denominator, 1 in the numerator, denominator is 2, 3, 4, 6, 8, 10) • Determines multiples of a whole number* • Determines common multiples of whole numbers*	• Identifies whole numbers 100 - 999 using 2-D and 3-D models* • Identifies whole numbers over 999 using 2- and 3-D models* • Rounds 4-, 5-, and 6-digit whole numbers to the nearest hundred • Rounds 4-, 5-, and 6-digit whole numbers to the nearest thousand • Rounds 4-, 5-, and 6-digit whole numbers to the nearest ten thousand • Writes whole numbers in standard and expanded form through the hundred thousands • Identifies a fractions in lowest terms from a region or set • Identifies eighths, reduced to lowest terms, from a region or set • Expresses "1" in many different ways (e.g., 3/3, 4/4)* • Expresses improper fractions as whole numbers (e.g., 4/2=2)* • Determines simple equivalent fractions using multiples • Converts fractions to lowest terms • Writes mixed numbers as improper fractions and improper fractions as mixed numbers • Compares fractions greater than or less than a given fraction using visual representations • Compares fractions and mixed numbers • Represents a decimal to the hundredths place (e.g., three hundredths = 0.03) • Expresses a simple fraction as a decimal • Writes a simple mixed fraction as a decimal and vice versa • Writes a basic percent as a fraction and vice versa (e.g., 10%, 25%, 50%, 100%)* • Expresses a percent as a fraction with 100 as the denominator and vice versa • Writes a basic percent as a decimal and vice versa*

 NE 3.4.1

* Both data from test items and review by NWEA curriculum specialists are used to place learning continuum statements into appropriate RIT ranges.

Blank cells indicate data are limited or unavailable for this range or document version.

NWEA's MAP Assessments and Descartes

For instance:

Subject: Mathematics
Goal Strand: Number Sense
RIT Score Range: 201-210
Subcategories: Number System (19), Meaning of Operations (5), Computation (50), New Vocabulary (6), and New Signs (0).

Through this, differentiated instructional strategies can be determined, and a course of action can be set, as we will discuss later.

Identifying Relative Weaknesses

Every student has a relative weakness, and so improvement can be made by all students, from your least successful to your most successful.

MAP Assessments are computer-based adaptive assessments, which means with each question as student answers correctly, their next question is harder. For each question a student answers incorrectly, a slightly easier question is given.

Identifying Relative Weaknesses

MAP Assessments provide a number of scores, but all of the scores are not treated equally for the purpose of identifying relative weaknesses. The scores provided are:

1. RIT Scale Scores
2. Percentile and Percentile Range
3. Lexile Range
4. Goal Strand Scores

The scores we focus on are the goal strand scores.

School: Shickley Public Jr/Sr School
Grade:
Reading Survey w/ Goals 6+ NE V4

Student ID	Name	Grd	Test Type	Test Date	Term	RIT	Std Err	RIT Rng	%ile	%ile Rng	Lexile® Rng	Goal Performance: Read Words / Vocabulary	Main Idea / Details	Infer / Predict	Text Features / Characteristics	Bias / Purpose / Text Elements
			S/G	Sep 11	FA13	249	4.5	245-254	93	89-95	1383-1533	248-271	246-272	248-276	232-257	224-242

Identifying Relative Weaknesses

Once the assessments have been completed, the scores for each student need to be evaluated. The goal strand score is calculated to determine each student's relative weakness in each subject area. Once the relative weaknesses have been determined, this information is given to the classroom teachers.

Overcoming relative weaknesses can be done in one of two ways. Students can:

1. Work to overcome relative weaknesses for each content area, or
2. Work to overcome their overall relative weakness in all content areas.

Overcoming Relative Weaknesses

Subject: Mathematics
Goal Strand: Number Sense
RIT Score Range: 201 - 210

Skills and Concepts to Enhance 191 - 200	Skills and Concepts to Develop 201 - 210	Skills and Concepts to Introduce 211 - 220
Number System	**Number System**	**Number System**
• Identifies whole numbers 100 - 999 using base-10 blocks* • Identifies whole numbers over 999 using base-10 blocks* • Identifies the numeral and written name for whole numbers with a zero between digits to the ten thousands place • Identifies the numeral and written name for whole numbers 10,000 to 100,000 • Identifies the numeral and written name for whole numbers over 100,000 • Identifies the numeral and written name for ordinal numbers 21st to 100th (e.g., 21st is twenty-first, and vice versa)* • Writes equivalent forms of whole numbers 11 to 20 using addition (e.g., 14 = 7 + 7)* • Compares whole numbers through 999,999 • Orders whole numbers less than 1000* • Orders whole numbers less than 10,000 • Rounds 2- and 3- digit whole numbers to the nearest ten • Rounds 3-digit whole numbers to the nearest hundred • Identifies whole numbers under 100 given place value terms (e.g., 3 tens and 4 ones = 34) • Writes whole numbers in standard and expanded form through the hundreds • Writes whole numbers in standard and expanded form through the thousands • Represents 1/3 with a diagram or model • Identifies one-half from a region or set* • Identifies 1/4 from a region or set • Identifies 1/3 from a region or set • Identifies 2/3 or 3/3 from a region or set* • Identifies tenths from a region or set* • Identifies a fraction (denominators other than 2, 3, 4, 8, 10) from a region or set	• Identifies whole numbers over 999 using base-10 blocks* • Identifies the numeral and written name for whole numbers with a zero between digits to the ten thousands place • Identifies the numeral and written name for whole numbers over 100,000 • Identifies a whole number that comes before and/or after a given number (over 100)* • Compares whole numbers through 999,999 • Orders whole numbers less than 10,000 • Orders whole numbers a million or greater • Rounds 4-, 5-, and 6-digit whole numbers to the nearest ten • Rounds 4-, 5-, and 6-digit whole numbers to the nearest hundred • Rounds 4-, 5-, and 6-digit whole numbers to the nearest thousand • Rounds whole numbers to the nearest hundred thousand • Writes equivalent forms of whole numbers using place value (e.g., 54 = 4 tens and 14 ones) • Writes whole numbers in standard and expanded form through the hundred thousands • Identifies halves of a region using nonadjacent parts • Converts a basic fractional numeral to lowest terms (e.g., halves, thirds, quarters)* • Writes mixed numbers as improper fractions and improper fractions as mixed numbers • Compares fractions (e.g., common denominator, 1 in the numerator, denominator is 2, 3, 4, 6, 8, 10) • Determines multiples of a whole number* • Determines common multiples of whole numbers*	• Identifies whole numbers 100 - 999 using 2-D and 3-D models* • Identifies whole numbers over 999 using 2- and 3-D models* • Rounds 4-, 5-, and 6-digit whole numbers to the nearest hundred • Rounds 4-, 5-, and 6-digit whole numbers to the nearest thousand • Rounds 4-, 5-, and 6-digit whole numbers to the nearest ten thousand • Writes whole numbers in standard and expanded form through the hundred thousands • Identifies a fractions in lowest terms from a region or set • Identifies eighths, reduced to lowest terms, from a region or set • Expresses "1" in many different ways (e.g., 3/3, 4/4)* • Expresses improper fractions as whole numbers (e.g., 4/2=2)* • Determines simple equivalent fractions using multiples • Converts fractions to lowest terms • Writes mixed numbers as improper fractions and improper fractions as mixed numbers • Compares fractions greater than or less than a given fraction using visual representations • Compares fractions and mixed numbers • Represents a decimal to the hundredths place (e.g., three hundredths = 0.03) • Expresses a simple fraction as a decimal • Writes a simple mixed fraction as a decimal and vice versa • Writes a basic percent as a fraction and vice versa (e.g., 10%, 25%, 50%, 100%)* • Expresses a percent as a fraction with 100 as the denominator and vice versa • Writes a basic percent as a decimal and vice versa*

NE 3.4.1
* Both data from test items and review by NWEA curriculum specialists are used to place learning continuum statements into appropriate RIT ranges.
Blank cells indicate data are limited or unavailable for this range or document version.

Overcoming Relative Weaknesses

Once a relative weakness has been determined, we refer to the Descartes chart to help us understand what a student should know, what they should be learning, and what they should be preparing for at their current, individual level of knowledge.

The next step in the transition from identifying to overcoming relative weaknesses is for the teacher and his or her planning. It is the rephrasing of the Descartes statements of what students can do into objectives and questions.

For example, in Mathematics, Number Sense: 201-210, it says:

> "Identifies a whole number that comes before and/or after a given number (over 100)."

Overcoming Relative Weaknesses

Changing this from a blanket statement to a standards-like objective would read as:

> "Students will be able to identify a whole number that comes before and/or after a given number (over 100)."

If this is what a student should be able to do, the next step is to determine how a student will be able to demonstrate that ability.

This step is where the development of interventions and instructional aids comes in. Following the same example of Mathematics, Number Sense: 201-210, a series of questions/exercises can be produced which could be assigned separately, or as a part of a worksheet for all of Number Sense 201-210.

Overcoming Relative Weaknesses

This is one example of the process used to overcome the relative weaknesses of students, with minimal work on the part of the teacher.

We have three distinctly different approaches to overcoming the relative weaknesses of students based off of NWEA's MAP testing, and the information provided by Descartes:

1. Creation and implementation of a series of interventions and instructional aids.
2. Khan Academy Knowledge Map for Math
3. Conversations of Learning

There are strengths and weaknesses to each of these approaches, which are provided below with a quick description.

Overcoming Relative Weaknesses

Creation and Implementation of a Series of Interventions and Instructional Aids:

This is the outlined approach, and may be the first that comes to mind.

Once interventions and aids are created, students can work their way deeper into the content, and can progress along a goal strand as quickly as their abilities allow.

Strengths: Students can progress as assigned by a teacher or independently at their own individual rate.

Weakness: The time needed to develop the interventions and instructional aids.

Overcoming Relative Weaknesses

Khan Academy Knowledge Map for Math:

This approach is similar to the last approach, but is different as it relates specifically to math, and the process involved in math.

Strengths: Students can work at their skill and ability level and progress in difficulty as their skills improve without much direct interaction with the teachers. Students thoroughly enjoy working in the Khan academy Knowledge Map.

Weakness: It isn't available in any other subject area, and it doesn't line up as cleanly with Descartes or the state standards. A little initial research will need to be done to determine students initial starting point.

Overcoming Relative Weaknesses

Conversations of Learning:

In this approach, a teacher will sit down with students to discuss the concepts the student should be mastering at his or her knowledge level, and simply discuss the ideas to see what students know and what they don't.

Strengths: Teachers can see what students understand and their growth in understanding, because students can explain their understandings through the use of background knowledge and connections to the content areas. There is less preparation time needed for this approach.

Weakness: Time. Not every teacher believes he or she has the time to sit down and spend five minutes with each student in his or her class to discuss a particular concept or subject area.

Overcoming Relative Weaknesses

A Hybrid Approach:

One hybrid approach to overcome this feeling could be the use of small groups of students in the same RIT Scale range.

The students could be provided interventions or instructional aids to work through, and then come together for a five minute discussion to talk about what they understood and what they didn't.

This would allow the teacher to benefit from the strengths of both approaches while avoiding some of the potential weaknesses.

Wrapping It Up

This may seem like a small school strategy, but at larger districts, the economy of scale allows for more teachers to break the needed materials into smaller sections, making the work more manageable, and implemented more quickly.

There will always be those who “can’t” make the changes needed to help our students be successful. At some point, we must look at what we are doing and decide if we are preparing our students to be successful, or if we are simply going through the motions.

In 2001, President Bush challenged the educational system to leave no child behind, with no real plan to accomplish the goal. Twelve years later, we are all still left to our own devices to ensure the success of our students, even though we are challenged with meeting ever increasing goals. Using NWEA’s MAP assessments and Descartes, can help schools to identify and overcome student’s relative weaknesses, and meet those goals.

Questions, Comments, and Concerns

www.facebook.com/ManeuverEducation

@mr_ippensen

dippensen@longhornpower.org