



Virginia Department of Education

Response to the Committee Questions for RFP DOE-SGA-2012-15

Due date: 01/03/2013

MAP for Mathematics, Reading, and Language Usage Assessments



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Request for Additional Information

MAP for Mathematics, Reading, and Language Usage Assessments

Alignment

Provide evidence of alignment to the current Standards of Learning including a comparative chart of content standards developed by your company to VA content standards for each content area/grade level that your proposed assessment(s) addresses and numbers of items for each standard. If you are planning to develop assessments in response to the contract being awarded, provide the content standards that you will include in your assessment(s) and the number of items you will develop for each standard with a timeline.

MAP assessments are built with goals and subgoals, which group items such that they may be aligned to any state's assessment. The goals and subgoals act as a kind of proxy between our item bank and our partners' standards. Appendix 1

shows the Virginia Standards of Learning (Virginia SOL) aligned to each MAP subgoal in the mathematics, reading, and language usage assessments and the number of items in each subgoal. These data are being supplied in order to provide a sense of the depth and breadth of the item pool as it applies to an adaptive test.

When viewing this data, it is important to consider that NWEA's assessments are adaptive and draw from a large pool of items aligned to the Virginia SOL. Unlike fixed-form assessments, NWEA's assessments are unique to each student and provide information about individual student growth. Students respond to approximately the same number of items from each goal area, which are demonstrated by Appendix 1 to align to Virginia standards.

Even though students might not see an item aligned to each Virginia SOL, the RIT scale (described in Section 2.2 of Attachment 3 of NWEA's December 07, 2012 submission) provides scores that accurately describe what skills and concepts students have mastered, skills and concepts they should currently be learning, and skills and concepts they are ready to begin learning. In essence, the Computerized Assessment Test (CAT) engine selects items that will provide relevant data about a student's individual strengths and weaknesses within the context of the Virginia SOL.

Student Growth

Provide the rationale for the measure of student growth methodology included in Requirement 3.2. Also provide the procedures used to validate the measures of growth including statistical processes.

Rationale

MAP uses a stable and reliable scale called the RIT scale (see Section 2.2 of Attachment 3 of NWEA's December 07, 2012 submission) to measure student growth. The RIT scale was built using Item Response Theory (IRT). NWEA adopted IRT in general and the Rasch model in particular to create vertical scales.

Dr. Gage Kingsbury's 2003 paper, "A Long Term Study of the Stability of Item Parameter Estimates" (see Appendix 2), examines the stability of the RIT scale. This study found the RIT scale had remained virtually unchanged even after twenty years of use. NWEA's RIT scales have remained stable measures of achievement status and growth for over thirty years. While student and school performance has changed over the years, comparability of RIT scores has not drifted at any time. This provides NWEA's partners with a long-term solution permitting longitudinal tracking of data, from individual student growth profiles to organizational performance indicators.

By relying on RIT scale scores from an individual student's tests as the unit of measure, change (growth) in status scores for the student retains the direct link between those scores and the status scores upon which they were based. This supports an intuitive interpretation of growth as the change in status on a stable scale between two points in time. Further, using the standard errors of the status scores to compute the standard error of change allows confidence in the change scores themselves and well as decisions based on them. Finally, this treatment of change scores (simple difference in scale scores, qualified by its standard error) provides a solid foundation for a wide range of analytic investigation of growth ranging from growth for an individual student to growth classes or groups of students over school year to multi-year analyses of intact student cohorts. The 2011 RIT scale growth norms study is one large example of such an investigation (see Section 3.2 of Attachment 3 of NWEA's December 7, 2012 submission).

Growth Validation

Both achievement status and growth are validated using several methods. These methods include content validation, studies of concurrent validity, studies of predictive validity, and studies of criterion-related validity.

More traditional forms of validity such as concurrent validity are challenging to initiate, primarily because educational entities commonly test students routinely only with a state sponsored accountability test. Such tests often assess achievement over gross time periods, making concurrent validity studies subject to key limitations. Nevertheless, NWEA routinely pursues estimates of concurrent validity by examining the relationships of MAP scores with scale scores from state accountability tests.

In addition, using the data from NWEA developed scale-alignment studies, evidence for both predictive validity and criterion-related validity are built. These procedures are described in the *NWEA 2011 Technical Manual* starting on page 182 (included on CD with NWEA's December 07, 2012 submission). More recently, individual student data from mathematics, reading, and language usage tests for fall, winter, and spring terms are used as evidence for the discriminant validity of MAP scores. This evidence has not yet been incorporated into the current technical manual.

Specifically, the procedures to validate MAP as a growth measure have taken several forms. Formal investigations have been conducted into the construct validity and measurement invariance of MAP tests (Wang, McCall, Jiao & Harris, 2012 (Appendix 3)). In addition, the construct of longitudinal achievement using a vertical scale (RIT reading and mathematics scale, specifically) was validated using a latent growth modeling approach (Wang, Jiao & Zhang, 2012 (Appendix 3)). These studies provide strong support for the validity of the RIT scales as a platform to measure achievement growth.

Given that NWEA uses differences in (status) achievement estimates as estimates of achievement growth, it is imperative that status estimates (RIT scores) contain minimal measurement error. SEM serves as a form of first level check on the confidence to be placed in the score as a valid indicator of the student's ability. However, NWEA also monitors other indicators that contribute to making such judgments. Considerable attention is given to Individual Score Validity (ISV) by analyzing student effort demonstrated throughout the test event (Kingsbury & Wise, 2012 (Appendix 3); Wise, 2012 (Appendix 3); Wise, Kingsbury, Hauser, & MA, 2012 (Appendix 3); Wise, Ma & Theaker, 2012) (Appendix 3). Effort is operationalized using a set of heuristic flags triggered by combinations of rapid response times and incorrect answers in different portions of the test. Planning is currently underway for incorporating these ISV flags into production test scripts and reports. By helping to ensure test score validity, arguments for the validity of inferences depend on growth are strengthened.

More about the validity of MAP assessments may be found in Attachment 3 Section 2.1 of NWEA's original submission.

Reporting

Provide your best example of a report derived from the assessment's results which illustrates an individual student's growth (not performance).

NWEA's Student Progress Report (Figure 1) provides individual student results for each assessment a student has taken. The Student Progress report includes individual achievement level and rate of growth over time, and provides district averages and national growth data to allow comparisons within Virginia and nationwide. Data are displayed in both text and graph format. This report is often shared with parents and students.

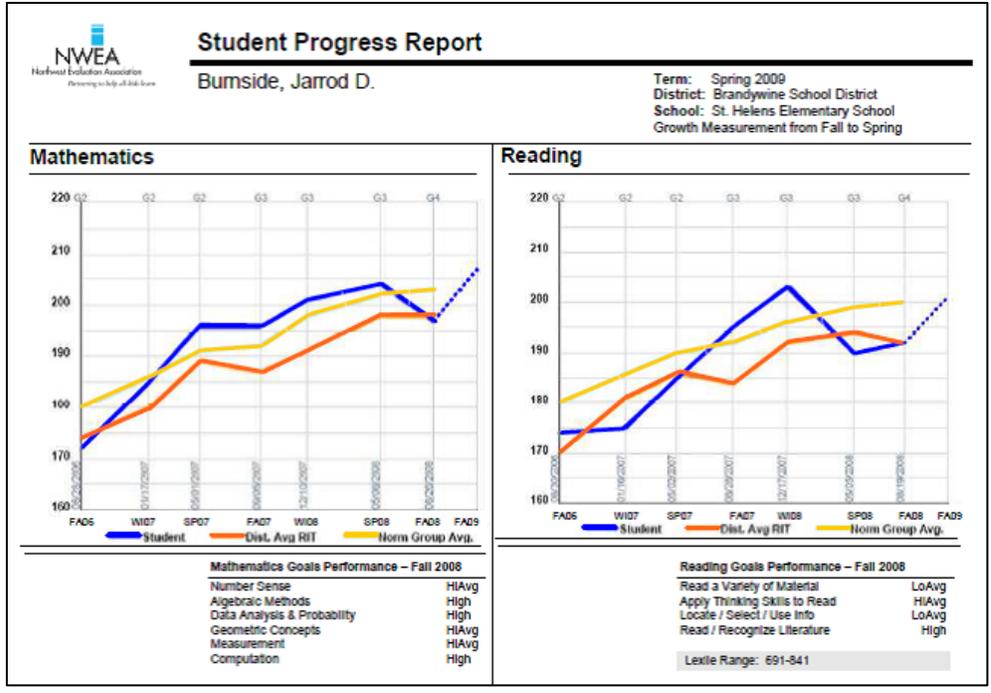


Figure 1: Student Progress Report

NWEA also provides the Student Goal Setting worksheet (Figure 2) that teachers can share with students and parents. This report shares MAP results with students and is a powerful way to give students ownership of their learning and achievement. Utilizing NWEA growth norms, teachers can work with students and their parents in planning for academic growth throughout the school year, and identifying benchmarks students can recognize as they strive to meet their growth goals. The Student Goal Setting worksheet template is shown below.

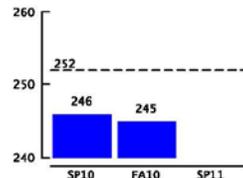


Student Goal Setting Worksheet

Aboukasm, Georges R.
Student ID: 150004004

District: Grosse Pointe Public School System
School: Brownell
Growth Measured from: Spring 2010 to Spring 2011

Mathematics (Math Survey w/ Goals 6+ MI V3.1)

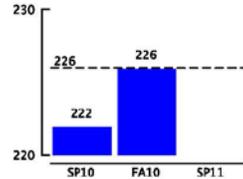


Projected RIT: 252
My Goal: _____
RIT Growth: *

	SP10	FA10	SP11
Overall RIT Score	246	245	
Goal Performance			
Number and Operations			
Algebra	237-252		
Measurement	237-252		
Geometry	244-256		
Data and Probability	234-249		
	238-251		

Student Action Plan: _____

Reading (Reading Survey w/ Goals 6+ MI V3.1)

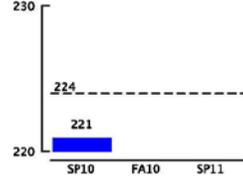


Projected RIT: 226
My Goal: _____
RIT Growth: *

	SP10	FA10	SP11
Overall RIT Score	222	226	
Goal Performance			
Word Recognition, Word Study, Fluency	223-237		
Narrative Text	213-227		
Informational Text	226-240		
Comprehension and Metacognition	216-229		
Lexile® Range	897-1047L	969-1119L	

Student Action Plan: _____

Language Usage (Language Survey w/ Goals MI V3.1)



Projected RIT: 224
My Goal: _____
RIT Growth: *

	SP10	FA10	SP11
Overall RIT Score	221		
Goal Performance			
Writing Genre	195-212		
Writing Process	204-221		
Grammar and Usage (Grammatical Structures)	228-244		
Grammar and Usage (Punctuation and Capitalization)	225-242		
Spelling	204-218		

Student Action Plan: _____

Student Signature: _____ Instructor Signature: _____

Parent Signature: _____ Date: _____

Explanatory Notes

RIT ranges may indicate an **area of relative strength** or **area of possible concern** determined by comparing the student's Goal Performance score with the student's Overall RIT Score for the test event.

* Projected RIT is only reported when there is growth norm data and a test event in the initial term. RIT Growth is only reported when there are test events in both the initial and final terms.

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Figure 2: Sample Student Goal Setting Worksheet

Technology

For online testing, can portable devices (tablets, iPads, netbooks) be used with the same fidelity as CPUs/laptops?

According to NWEA's product roadmap, mobile assessment on iPads is planned for fall 2013 for the Web-based MAP system.

Can reports be accessed with fidelity from portable devices 24 hours a day, 7 days a week?

Web-Based MAP reports have not yet been optimized for use on mobile devices, nor have they yet been validated to offer 100% functionality. Though NWEA does not support this functionality at this time, its partners can choose to access the reporting application as a web application.

NWEA has not tested and does not plan to test access of client-server MAP reports on portable devices.

Expand on the technology information provided in Requirement 4.x to include specific requirements about technology infrastructure related to bandwidth, caching capabilities, numbers of concurrent testers, redundancy of data storage as well as fail-

Web-Based MAP

Bandwidth

The key bandwidth requirement is available Internet bandwidth sufficient for adequate system performance during student testing. The most important bandwidth considerations are:

- Number of computers available for concurrent tests.
- Bandwidth available through your main Internet connection.
- Bandwidth available through any limitation points in your internal network (such as school-to-district connections when the district has the main Internet connection).

The initial load is approximately 2.2 MB, and the load time varies based on available bandwidth.

The bandwidth requirements listed in below are subject to change. In addition, the bandwidth needed may vary from one term to the next, and from year to year, based on testing plans.

Caching Capabilities

Additional bandwidth is needed at the beginning of each test to load the initial test questions and the question display software into cache in each computer's browser.

Number of Concurrent Testers

The following table can help users determine the approximate bandwidth to allocate based on the number of concurrent testers in an organization.

Students Testing Concurrently	Average Available Bandwidth Required*
	MAP Tests
50	0.15 Mbps
100	0.3 Mbps
250	0.75 Mbps
500	1.5 Mbps
1000	3 Mbps

*The table identifies the average bandwidth in Megabits per second (Mbps) required to provide adequate performance and avoid system time-outs during the question-and-answer portion of student tests.

Redundancy of Data Storage

The web-based system components are designed for high availability during scheduled system availability hours. Each remote facility that hosts the web-based system is fault tolerant with redundancy at many levels, including power, cooling, servers, databases, networks, and Internet connections. Because of the high availability design, restoration from backups should rarely be needed. However, NWEA has arranged a backup plan that includes the following elements:

- Database restore to a recent point in case data has been corrupted.
- Incremental database backups on a nightly basis.
- Full database backups on a weekly basis.
- Backup media encrypted and stored off-site.

Fail-Safe Protocols

The web-based platform is an end-to-end online testing solution with components that comply with the highest standards for data security, transfer speed, and disaster recovery, while providing outstanding up-time during scheduled system availability

Client-Server MAP

Bandwidth

Because an Internet connection is only required to run TestTaker (see Appendix 4) and to access the reports site, bandwidth requirements are not applicable.

Caching Capabilities

The client-server platform does not require caching capabilities because the Internet is not required for use of the system.

Number of Concurrent Testers

There are no limitations on the number of concurrent testers, except when utilizing a wireless environment (LAN only) for testing. The wireless requirements are listed below:

Wireless Requirements	
Wireless Standard	802.11 G (54 mb/s) or higher
# of Concurrent Connections	12-15 connections per wireless access point (20 max)

Redundancy of Data Storage

Because the client-server platform is hosted on a partner’s network, NWEA is not in control of data redundancy. However, the hosted components of the client-server system are designed for high availability during scheduled system availability hours. Each remote facility that hosts the web-based system is fault tolerant with redundancy at many levels, including power, cooling, servers, databases, networks, and Internet connections. Because of the high availability design, restoration from backups should rarely be needed. However, NWEA has arranged a backup plan that includes the following elements:

- Database restore to a recent point in case data has been corrupted.
- Incremental database backups on a nightly basis.
- Full database backups on a weekly basis.
- Backup media encrypted and stored off-site.

Fail-Safe Protocols

The client-server user interface for test administration and delivery by school personnel is nearly parallel to that of the web-based platform.

Please also refer to NWEA’s response to requirement 4.5 of Attachment 3 of its December 07, 2012 submission for a comprehensive description of the technology infrastructure of the MAP system.

During online testing, will remote, “live-time” diagnostic assistance be provided? If so, describe this assistance.

While NWEA does not provide “live time” diagnostic assistance, we do provide technical support via phone or email before, during, and after testing. NWEA’s Technical Support Team is available by toll-free Support line or email, Monday through Friday, 7:00 a.m. to 5:00 p.m. Eastern Time (ET), excluding federally-recognized holidays observed by NWEA. Our Technical Support staff is well-versed in the implementation of NWEA’s assessment system and can provide assistance with generating Roster Files, configuration of the MAP system components, accessing online reports, and questions that may arise in the use of the system.

NWEA’s call routing and escalation protocols efficiently route service requests to the appropriate personnel. NWEA staff will respond with accurate, timely, courteous, and consistent service. To optimize responsiveness and maintain consistently high customer satisfaction, NWEA uses established Information Technology Infrastructure Library-based (ITIL) escalation protocols.

As a complement to standard technical support services, NWEA also offers optional Technical Consulting services which can be purchased separately by partner divisions to assist with accounts having customized or complex technical configuration. NWEA's Technical Consultants may be on the ground with a partner, provide phone support and remote desktop support, and/or coordinate the acquisition of other resources to support a successful testing experience from a technology point of view.

What level of local IT support should the division expect in each school/classroom in order to appropriately support successful testing?

NWEA's MAP Assessments are designed with the ease of implementation in mind. NWEA understands that district resources are valuable, and is constantly mindful of the impact to these resources when developing solutions. The MAP Assessment platforms are intended to be easily supported after initial setup, and should require limited local IT support after implementation.

NWEA's Web-Based Platform

The web-based platform is an end-to-end online testing solution with components that comply with the highest standards for data security, transfer speed, and disaster recovery. The web-based platform is accessible to any computer inside or outside of the division that meets the hardware and software requirements. The support required to administer these functions is:

- Prepare computers and browsers for the MAP system
- Establish policies to ensure student data remains secure in the MAP system
- Determine network bandwidth needed to support MAP testing and ensure bandwidth meets the technical specifications required for MAP
- Perform routine audits of the lab workstations and network to confirm their preparedness in advance of each testing season

NWEA plans to add a new capability to our web-based platform to allow for lower grade Internet connections, expected to be available by July 2014. As an alternative for lower grade Internet connections, NWEA offers the client-server platform as a solution.

NWEA's Client-Server Platform

The client-server platform is an end-to-end testing solution for administering tests on the TestTaker Client workstation without Internet connection. The client-server platform is made up of four main components. The support required to administer these components is:

- Install and set up the Network Test Environment on a folder located on the local network.
- Install and set up the Network Test Environment Administration software for managing the divisions' NTE.
- Install MAP TestTaker on a network server or on individual testing workstations.

- Perform routine audits of the lab workstations and network to confirm their preparedness in advance of each testing season.

Both the web-based and client-server assessment systems will be deployed and operated independently for each Virginia division, requiring no state-level mediation. Technical requirements for both MAP platforms were included with NWEA's December 07, 2012 submission as Appendix P and with this response as Appendix 4.

Availability

For those assessments that are being developed, when will assessments be available for operational use?

NWEA did not propose to develop new assessments for mathematics, reading, and language usage.

List of Appendices

Appendix 1: Evidence of Alignment for MAP for Mathematics, Reading, and Language Usage Assessments

Appendix 2: A Long Term Study of the Stability of Item Parameter Estimates

Appendix 3: NWEA Studies

Appendix 4: MAP System Technical Requirements