Using the M4 Item Description Report 2014-2015 to Support Next Steps in Instruction for the Class and for Individual Students

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NOVA SCOTIA

Description

The purpose of this webinar is to support teachers, school administrators, board mathematics leads, mathematics coaches, mathematics mentors, and others in using the 2014-2015 NSA M4 Item Analysis to inform next steps in instruction for the class and for individual students. The session will take participants into the item analysis provided to

- examine the outcome and the item description
- discuss why an item is described as a Knowledge, Application, or Analysis question
- identify patterns of student performance within strands, outcomes, and/or levels of question
- use the curriculum documents to support the next steps in instruction for the class and individual students

Before we begin…

In order to participate fully in this webinar, you will require the following materials:

- your school's or your own classroom data for the 2014-2015 NSA 4 (M4)
- Mathematics 2 and Mathematics 3 curriculum documents
- a print copy of the recording sheet click on the link below to access this document

You may download the Mathematics 2, Mathematics 3 and recording sheet by clicking on "Documents to download" button from the bottom right of this screen.

Before we begin…

If you have any questions during the presentation, please post them in the chat at the left of your screen, and we will spend some time during the webinar as a Q/A time.

This session will be recorded and the archive will be available within the next two weeks on the DVL website. http://dvl.ednet.ns.ca

If you have technical difficulties, please call our help desk at (902) 424-2450.

Welcome

- Introductions
- Logistics

Goal of the Webinar

- Support teachers, school administrators, board mathematics leads, mathematics coaches, mathematics mentors, and others in using the 2014-2015 NSA M4 Item Description Report to inform next steps in instruction for the class and for individual students

Sequence of the Webinar

The session will allow participants to

- understand the cognitive levels and why an item is described as
  - Knowledge (Level 1)
  - Application (Level 2)
  - Analysis question (Level 3)
- understand the background to the creation of the Item Description Report
- understand the connection between the 2014-2015 Item Description Report Analysis and the *Lessons Learned* document for Grade 4
- examine provincial, board, and school data
- examine the outcome and the item description
- identify patterns of student performance within strands, outcomes, and/or levels of questions
- use the curriculum documents to support the next steps in instruction for the class and individual students

Cognitive Levels

Knowledge questions (Level 1) may require students to recall or recognize information, names, definitions, or steps in a procedure.

Example: For each set of numbers, circle the number that is greatest.

a.	433	157	86	100
b.	508	580	850	805
c.	925	936	919	931
d.	800	888	808	880

Cognitive Levels

Application/comprehension questions (Level 2) may require students to make connections, represent a situation in more than one way (translating between representations), or solve contextual problems.

Example:

Elastics are sold in boxes of 500 elastics, large bags of 100 elastics, small bags of 50 elastics, balls of 10 elastics, and single elastics. What would you buy if you wanted 753 elastics?

Cognitive Levels

Analysis questions (Level 3) may require students to go beyond comprehension and application to higher order thinking skills, such as generalizations and non-routine problem-solving.

Example: Bill represented the number 634 with base-ten blocks. He hid some of them behind the screen as shown below. What base-ten blocks are hidden behind the screen? Explain how you know.

Analysis of Provincial Data

- The *Lessons Learned* document was developed based on an analysis of the Item Description Report for the 2013–2014 Nova Scotia Assessment (NSA): Mathematics in Grade 4 (M4).

- The document is a living document which means that we will be updating it over the next few months to reflect the 2014-2015 Nova Scotia Assessment (NSA): Mathematics in Grade 4 (M4).

Examining the Item Description Report

- We will use the provincial data to take you through the process of the analysis as your school data is all very different.
- We will use a recording sheet(s) to organize the data that we have highlighted.
- Using this organized data, we can look at the areas of challenge for our students.
- This will enable us to use use the curriculum documents to support the next steps in instruction for the class and individual students.

A	B	C	D	E	F	G
Item Number	**Strand**	**Component**	**Outcome Match**	**Cognitive Levels**	**% Provincially Correct**	**Item Descriptor**
1	Number	Computation	3N09	Knowledge	88%	add a 2-digit whole number with a 2-digit whole number arranged vertically
2	Number	Computation	3N09	Knowledge	91%	add a 3-digit whole number with a 2-digit whole number arranged horizontally
3	Number	Computation	3N09	Knowledge	72%	subtract a 2 digit whole number from a 3-digit whole number arranged horizontally
4	Number	Computation	3N09	Knowledge	49%	subtract two 2-digit whole numbers arranged vertically
5	Patterns & Relations	Id/Comp/Ext	3PR01	Knowledge	65%	recognize an error in an increasing number pattern
6	Number	Computation	3N06	Knowledge	53%	subtract numbers involving whole tens
7	Number	Counting/PV	2N07	Knowledge	65%	add partioned numbers
8	Number	Word Problem	3N09	Application	77%	solve addition story problem: Join Result Unknown
9	Patterns & Relations	Id/Comp/Ext	3PR01	Knowledge	80%	identify the missing terms in a given increasing pattern over a decade
10	Number	Computation	3N06	Knowledge	82%	apply mental mathematics strategies for adding two 2-digit numerals
11	Number	Word Problem	2N09	Application	58%	solve addition story problem: Join Change Unknown
12	Number	Representation	1N03	Application	95%	represent and partition numbers to 100; count in a variety ways
13	Number	Comp/Ord/Rnd	3N03	Application	71%	compare and order numbers to 1000 using a number line
14	Number	Comp/Ord/Rnd	3N03	Application	64%	compare and order numbers to 1000 using a number line
15	Number	Representation	3N05	Knowledge	40%	represent and partition numbers to 1000; the meaning of place-value for numerals to 1000
16	Number	Representation	3N11	Application	35%	demonstrate an understanding of multiplication to 5 x 5 by using an array
17	Number	Comp/Ord/Rnd	1N04	Application	83%	compare, order and identify missing numbers (to 20) on a number line from the least to the greatest
18	Number	Comp/Ord/Rnd	2N05	Application	54%	compare, order and identify missing numbers (to 100 using other benchmarks) on a number line from the le
19	Number	Comp/Ord/Rnd	3N03	Application	80%	compare, order and identify missing numbers (to 1000) on a number line from the least to the greatest
20	Number	Representation	3N02	Application	67%	represent a given number as an expression
21	Patterns & Relations	Patterning/PV	2N05	Application	59%	identify missing numbers on a hundred chart (to 100) using place value strategies
22	Number	Rnd/Est	3N08	Application	44%	solve a word problem using rounding and estimation
23	Number	Representation	3N01	Application	88%	determine the value of a given set of coins by using skip counting
24	Measurement	Word Problem	3M04	Analysis	36%	solve a word problem using personal referents for measuring mass (g, kg)
25	Number	Model	2N09	Application	69%	represent subtraction using base-ten blocks
26	Number	Model	2N09	Application	75%	represent addition using base-ten blocks
27	Number	Word problem	3N11	Analysis	73%	represent a story problem with a multiplication equation
28	Patterns & Relations	Id/Comp/Ext	3PR02	Application	81%	recognize an error in a descreasing pictorial pattern
29	Number	Computation	2N09	Application	88%	solve an addition sentence (2-digit to 2-digit) and the corresponding subtraction sentence
30	Stats & Probability	Line Plot	3SP01	Analysis	61%	answer questions arising from a given line plot

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Recording Sheet

Grade	Outcome	Cognitive Level	Verb	Topic
3		knowledge	subtract	vertical subtraction
3		knowledge	subtract	subtract whole tens
2		application	solve	word problem
3		knowledge	represent and partition	meaning of numbers
3		application	represent	meaning of operation
2		application	compare and order	whole numbers
2		application	identify using strategies	missing numbers
2		application	estimate and solve	word problem
3		analysis	solve	word problem

Analyzing Your School Data

- Using your school data, we are going to take you through the same process that we used when analyzing the provincial data to create the *Lessons Learned* document.
- Using an electronic or hard copy of your schools results, highlight all items in your school results on which fewer than 60% of students were successful.
- Use the Recording Sheet(s) to organize the data that you have highlighted.
- This process helps us to see patterns, trends, verbs in the item descriptors, mathematics concepts/topics that challenged our students and the cognitive level of the items.

Next Steps for Instruction and Assessment

- Use the trends you've discovered to determine next steps for classroom-based instruction and assessment.

- Knowing the grade level, outcome, level of question, and topic, you can identify sample questions from the curriculum document (or your core resource) that should be part of instruction and assessment in your classroom.

Knowledge (Level 1) 3N09

Item Descriptor

Subtract two 2-digit whole numbers arranged vertically

Outcome

Students will be expected to demonstrate an understanding of addition and subtraction of numbers (limited to 1-, 2-, and 3-digit numerals) with answers to 1000 by

- using personal strategies for adding and subtracting with and without the support of manipulatives
- creating and solving problems in context that involve addition and subtraction of numbers concretely, pictorially, and symbolically.

Knowledge (Level 1) 3N09

Using your Mathematics 3 curriculum document, find outcome 3N09.

Find 3 samples of knowledge (level 1) questions.

Record those questions.

Application (Level 2) 2N09

Item Descriptor

Solving addition story problem: Join Change Unknown

Outcome

Students will be expected to demonstrate an understanding of addition (limited to 1- and 2- digit numerals) with answers to 100 and the corresponding subtraction by

- using personal strategies fro adding and subtracting with and without the support of manipulatives
- creating and solving problems that involve addition and subtraction
- explaining and demonstrating that the order in which numbers are added does not affect the sum
- explaining and demonstrating that the order in which numbers are subtracted matters when finding a difference

Application (Level 2) 2N09

Using your Mathematics 2 curriculum document, find outcome 2N09.

Find 3 samples of application (level 2) questions.

Record those questions.

Analysis (Level 3) 3M04

Item Descriptor

Solving a word problem using personal referents for measuring mass (g, kg) (What students are thinking)

Outcome

Students will be expected to demonstrate an understanding of measuring mass (g, kg) by

- selecting and justifying referents for the units grams and kilograms (g, kg)
- modelling and describing the relationship between the units grams and kilograms (9g, kg)
- estimating mass using referents
- measuring mass using referents

Analysis (Level 3) 3M04

Using your Mathematics 3 curriculum document, find outcome 3M04.

Find 3 samples of analysis (level 3) questions.

Record those questions.

Summary

Using the item descriptors, analyzing the data, and making connections to the curriculum outcomes, and the suggestions for instruction and assessment contained within the curriculum documents can help us identify next steps for instruction.

Questions and Contact Information

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This session has been recorded and the archive will be available within the next two weeks on the DVL website.
http://dvl.ednet.ns.ca/browse/results/taxonomy%3A169

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