# K TO 12 POINTERS

VOL. 2 NO. 1 JUNE 2014

REX Book Store

# ALIGNING TO THE NEW COMPETENCIES

# About Rex K to 12 Pointers on Curriculum Changes

**Dear Partners in Education**,

Greetings of peace!

Once again, the Philippine educational landscape is experiencing great changes in the K to 12 curriculum. Hence, we at Rex Book Store present to you the **Rex K to 12 Pointers** – an exclusive annual additional teacher's resource material designed to guide teachers by giving useful suggestions on how to best address specific academic concerns using both Rex teaching and learning materials. Particularly for this issue, the focus is on how teachers can better understand curriculum crosswalks as they impact teaching and learning. Also, this new volume of the Rex K to 12 Pointers for School Year 2014–2015 focuses on how to respond to the K to 12 curriculum version transitions per subject and grade level.

Since the implementation of the K to 12 curriculum in 2011, the DepEd has released several versions of it through its official memoranda, necessitating changes in scope and sequence, and competencies per subject per grade level with each latest release. This regular updating has had more impact on some subjects more than others. For instance, the most notable changes are in the Social Studies subject in which Grade 3 now covers appreciation of one's own region, and Grades 7 to 10 now cover new topics per level. These latest developments in the curriculum pose a challenge to educators, as they must ensure strict compliance in their implementation of the K to 12 program, from the administrative down to the classroom level.

In response, Rex Book Store shares your need to address the curriculum transitions, and we are committed to provide the necessary support to adopters of Rex titles. As your trusted partner, Rex has endeavored to come up with this new edition of the Rex K to 12 Pointers, covering the K to 12 curriculum transitions per subject as they relate to Rex titles. To ensure that Rex teaching and learning materials comply with the latest K to 12 curriculum standards and competencies, the Rex K to 12 Pointers features a curriculum crosswalk. In this crosswalk, our academic specialists have identified the additional lessons and exercises required to maximize the achievement of student learning outcomes per standard in the curriculum. In addition, the output of this crosswalk has been presented through a visual tabulation of what the curriculum transitions are, and how these transitions are addressed by the teaching and learning materials provided by Rex. Thus, this edition of the Rex K to 12 Pointers serves as a guide for you, while the additional lessons may be accessed in the Rex Interactive website via www.rexinteractive.com.

We hope that through the full compliance to the latest K to 12 curriculum that this new resource material offers, you would gain the confidence and peace of mind that you need in becoming effective educators. We are one with you in aspiring toward a successful implementation of the K to 12 basic education program for the benefit of our students. May our concerted efforts be the light to others as well as the mirror that reflects it.

Sincerely,

**Rex Book Store**

# Publisher's Note

Leaders should recognize that one of their prime obligations is to help members of their organizations feel confident and capable as they become motivated (Doll, 2009). Indeed, as principals, subject area coordinators, or classroom teachers, you are leaders in your own schools or classrooms. Part of your responsibilities as leaders is to provide assistance to your members. With the recent changes occurring in the K to 12 curriculum, leaders such as yourselves should support your members as they transition from one curriculum version to another.

The tasks of tracking changes in the curriculum, defining new competencies, and making new lessons to implement the new competencies are grueling for any teacher. But these are necessary tasks to ensure that learners won't be shortchanged by the changes happening, rather, that they reap the fulfillment of the objectives of those changes.

As your trusted partner, Rex Book Store understands the efforts and resources needed to track and implement the changes in the curriculum. Hence, it has endeavored to give you the **Rex Pointers** – a learning supplement that traces the different changes in the curriculum through a curriculum crosswalk, develops new lessons to accomplish the intentions of the competencies, and journeys with the teachers as they execute the new lessons in their classrooms. The curriculum crosswalk found in the Rex Pointers gives the teachers a view of the spiral movement of the curriculum by comparing old standards and competencies to the new ones. It identifies if there are gaps in the curriculum that should be filled to help students attain the intended learning outcomes. The Rex Pointers also contains ready-made lesson plans to address the new learning competencies, saving time for teachers in preparing their instruction. These lesson plans include combined competencies to show the integration of the topics. Finally, the Rex Pointers journeys with the teachers as they execute the new whole curriculum by providing a range of appropriate techniques and strategies.

Rex Book Store hopes that the Rex Pointers will guide teachers toward the direction of becoming true leaders of K to 12 in their schools and their classrooms. With the preparation and assistance that this material offers, teachers are assured that with Rex, "*You are booked for success.*"

**Don Timothy Buhain**
*Chief Operating Officer, Rex Book Store, Inc.*

# A Primer on Curriculum Crosswalks

The Philippine K to 12 curriculum has undergone various improvements since its implementation last 2011. The improvements can either be in terms of substitution, alteration, variation, restructuring, or value orientation change (Doll, 2001). And as in all changes or improvements, their success depended on how these have been planned, communicated, and accepted. The latest of the improvements were the December 2012 and December 2013 versions released by the DepEd.

In order for schools and teachers to plan and implement these recent improvements in the curriculum, there are processes needed to track them. The simplest but most useful way of tracking them is through a curriculum crosswalk or content map. The purposes of a curriculum crosswalk are (1) to gain information about the curriculum changes; (2) to ensure spiral progression; (3) to provide provision in analyzing gaps in student learning and to fill in these gaps; and (4) to find and integrate natural curriculum connections with the nature of the discipline (Jacobs, 2009).

## Defining a Curriculum Crosswalk

The elements in the curriculum that have undergone major changes are the content standards, performance standards, and learning competencies. In order to track these changes and plan actions to comply with them, a curriculum crosswalk is necessary. A curriculum crosswalk refers to a process used to cross-reference or to align the learning outcomes of the courses in a pathway (Bitters and Wigner, 2009).

Why perform a curriculum crosswalk?

A curriculum crosswalk allows for gaps to be found between current standards or learning competencies and expected knowledge and skills required by the discipline. These gaps and deficiencies can then be used to develop new competencies, additional lessons, new courses, and/or new opportunities for students to gain the necessary knowledge and skills.

When should a curriculum crosswalk be done?

Ideally, a curriculum crosswalk should be done before making a course syllabus or the subject's scope and sequence. This allows for changes of curriculum or course development to be incorporated in the instruction or instructional materials being developed.

## Steps in Performing a Curriculum Crosswalk

### Step 1:

Identify who will be involved in the curriculum review.

- ❑ The proponents determine the procedures used in completing the curriculum review.
- ❑ Documentation and update of the curriculum review are done by the proponents.

### Step 2:

Assemble all relevant standards and benchmarks.

- ❑ Content Standards
- ❑ Performance Standards
- ❑ Learning Competencies

Example:

**GRADE 1**

| Domain | Learning Competencies |
|---|---|
| **Listening Comprehension** | • Identify connections between text listened to and personal experience DELETED<br>• Make predictions about stories based on the cover or title, pictures, and details in the text DELETED<br>• Use an understanding of characters, incidents and settings to make predictions MOVED TO GRADE 2 3RD QUARTER<br>• Identify story to elements (characters, setting, plot, ending) in the text listened to<br>• Validate ideas made after listening to a story MOVED TO GRADE 2 2ND QUARTER<br>• Activate prior knowledge based on new knowledge formed MOVED TO GRADE 2 1ST QUARTER<br>• Listen carefully to texts read aloud DELETED<br>• Ask and answer simple questions (who, what, where, when, why, and how) about text listened to DELETED<br>• Identify connections between text listened to and personal experience<br>• Ask and respond to questions about informational texts listened to (environment, health, how-to's, etc.) DELETED<br>• Derive meaning from repetitive language structure<br>• Retell and/or reenact events from a story DELETED<br>• Talk about texts identifying major points and key themes DELETED<br>• Participate/engage in a read-along of texts (e.g., poems, repetitive texts) DELETED |

| Quarter/ Week | LC Listening Comprehension |
|---|---|
| **3rd Quarter 1–10 and 4th Quarter 1–5** | EN1OL-IIIa-j- 1.1<br>1. Listen to short stories/poems and note important details pertaining to<br>a. character<br>b. setting<br>c. events<br>2. Give the correct sequence of three events NEW<br>3. Infer the character feelings and traits NEW<br>4. Identify cause and/or effect of events NEW<br>5. Identify the speaker in the story or poem NEW<br>6. Predict possible ending of a story read<br>7. Relate story events to one's experience<br>8. Discuss, illustrate, and dramatize specific events NEW<br>9. Identify the problem and solution NEW<br>10. Retell a story listened to |

**December 2012 version** **December 2013 version**

Notice that the competencies were compared line by line. This not only helps track what happened to a particular competency, but also gives an idea of the changes that happened. In the example above, some of the competencies were either retained, deleted, moved, revised, or added.

**Step 3:**

Analyze and crosswalk the standards and competencies.

Note deficiencies and gaps in the curriculum. This part of the curriculum crosswalk can ensure that the learning competencies are in spiral progression. Also, at this vantage, the teacher can see the gaps that the curriculum may have.

Example:

| April 2013 | Remarks | December 2013 |
|---|---|---|
| 1st Quarter: Living Things and Their Environment | | |
| **Content Standards:**<br>Demonstrate understanding of photosynthesis and respiration as life energy processes DELETED | In this instance, the content standards were revised to give emphasis on content. The new learning standards discuss both content as well as the process of photosynthesis, whereas the old standards just focused on the process of photosynthesis and respiration.<br>The new content standards necessitates that there is a discussion on the plant part that procures photosynthesis and why this part provides that mechanism. | **Content Standards:**<br>Demonstrate understanding of the structure and function of plant parts and organelles involved in photosynthesis NEW |

**Step 4:**

Align the standards to the curriculum.

- ❑ After a comprehensive synopsis of standards and expectations has been developed, it must be compared to the goals and objectives of the subject area, subject scope and sequence, and the total curriculum.
- ❑ The most effective approach is to look at the curriculum in total and across all subject areas (vertical and horizontal alignments).
- ❑ This step should be able to accomplish integration, eliminate duplication, and optimize use of student time.

**Step 5:**

Redesign the curriculum to correct the deficiencies.

- ❑ Design new courses or revise current courses.
- ❑ Design teaching enhancements to support the standards.
- ❑ Both content as well as teaching and learning strategies can be modified to address the deficiencies.

**Step 6:**

Design assessments that verify attainment of standards.

- ❑ Verification of student success is essential if the curriculum is to produce student mastery of required skills.
- ❑ The assessment methods and tools must be developed in direct reference to the standards.

In looking at the crosswalk, the teacher can identify which are the target competencies that need to be developed. Thus, the teacher can now create an assessment to accomplish these targeted competencies. It is easier to view this using the curriculum crosswalk.

One limitation is in identifying the assessment tools to be used. This limitation is addressed by the curriculum map that can be developed when using the crosswalk.

**Step 7:**

Develop an implementation plan.

- ❑ Include items such as deadlines and timelines, resources, staff/professional development, barriers, and benefits.
- ❑ Professional development must be provided to assist teachers in dealing with the changes.
- ❑ Realistic timelines for implementation must be included.

**Step 8:**

Evaluate the results.

- ❑ The implementation plan should include collection of suitable data to document the effects of the reform on student performance.
- ❑ The concept of continuous improvement should be adopted with the recognition that reform is an ongoing and never-ending effort.

In this Rex Pointers, steps 1 to 5 have already been provided for the teacher. Thus, teachers no longer have to do the grueling process of identifying changes and developing new lesson plans to apply these changes.

## Advantages of Doing a Curriculum Crosswalk

The advantages of doing a curriculum crosswalk are the following:

1. A crosswalk is a simple and clear way to communicate the connections between curriculums. It is useful for explaining the changes in standards and competencies.

2. It is a good review tool. It can point to gaps in the standards and generate ideas/discussion on how to fill in those gaps. It is useful for writing and revising standards.
3. It supports an argument for face validity. The crosswalk can point to the extent to which a competency can cover the concept it purports to measure. This can also show the relevance of the assessment produced.

## Limitations of a Crosswalk:

However, a crosswalk should not be used to:

1. Link standards and assessments. It is not good for calibrating standards to test content. It can only describe the content. As a result, teachers would need to conduct a more sophisticated analysis on the test items.
2. Write standards to match test content.
3. Support an argument to establish validity. At most, a crosswalk can show connections (i.e., face validity), but it lacks the analysis necessary for a validity study.

Despite the limitations, the advantages of doing a curriculum crosswalk are still immense. The output can help in developing additional lessons that teachers can use for new and revised competencies.

## References:


1. Doll, Robert C. (2009). *Curriculum Improvement Decision Making and Process*. New York, USA: Allyn and Bacon.
2. Jacobs, H. and Johnson, A. (2009). *Curriculum Mapping Planner*. Virginia, USA: ASCD.
3. Ornstein, Behar-Horenstein et al. (2003). *Contemporary Issues in Curriculum, 3rd Edition*. Boston, USA: Pearson.
4. http://cte.dpi.wi.gov/files/cte/pdf/curriccrosswalk.pdf
5. www.adultedcontentstandards.ed.gov/.../Using%20Crosswalks%20for%2...
6. http://www.deped.gov.ph/ (Department of Education 2013 Curriculum Guides)

# Appreciation of the New Mathematics Curriculum Guides – Junior High School
# Tracing Changes in the December 2012 to December 2013 Versions

Curriculum is dynamic and changing. Last December of 2013, the Department of Education released through their official website the Curriculum Guide (CG) for G1–G10 Mathematics. In this curriculum guide version, new competencies (not present in the December 2012 CG version) were added, some were deleted from the December 2012 version, and others were revised through the inclusion of new topics, skills, and contexts.

Content and performance standards are not exempted from these curriculum reforms. Let us take a look at the example below.

| Statistics and Probability |
|---|
| **Content Standards:** |
| • Demonstrates understanding of key concepts, uses and importance of statistics, data collection/gathering, and the different forms of data representation. |
| **Performance Standards:** |
| • Collects and organizes data systematically and makes necessary representation to solve problem in research, business, education, technology, science, economics, etc. |

| 4th Quarter |
|---|
| **Statistics and Probability** |
| **Content Standards:** |
| • Demonstrates understanding of key concepts, uses, and importance of statistics, data collection/gathering, and the different forms of data representation, measures of central tendency, measures of variability, and probability. |
| **Performance Standards:** |
| • Collects and organizes data systematically and computes accurate measures of central tendency and variability and applies these appropriately in data analysis and interpretation in different fields. NEW |

**Figure 1:** *Sample Comparison of Content and Performance Standards*

Notice that learning competencies were presented by quarter. In addition, content standards and performance standards were revised through the inclusion of new subjects, skills, and contexts.

The table below summarizes the changes in the content and performance standards for Grade 7 Statistics and Probability based on Figure 1.

| Retained Content Standards from December 2012 Curriculum Guide Version | New Content Standards in December 2013 Curriculum Guide Version |
|---|---|
| The learner demonstrates understanding of the key concepts of statistics.<br>The learner demonstrates understanding of uses of statistics.<br>The learner demonstrates understanding of importance of statistics.<br>The learner demonstrates understanding of data collection/gathering.<br>The learner demonstrates understanding of the different forms of data presentation. | The learner demonstrates understanding of the key concepts of measures of central tendency.<br>The learner demonstrates understanding of the key concepts of measures of variability.<br>The learner demonstrates understanding of the key concepts of probability. |

| Retained Performance Standards from December 2012 Curriculum Guide Version | New Performance Standards in December 2013 Curriculum Guide Version |
|---|---|
| The learner is able to collect data systematically and apply these appropriately in data analysis and interpretation in different fields.<br>The learner is able to organize data systematically and apply these appropriately in data analysis and interpretation in different fields. | The learner is able to compute accurately measures of central tendency and apply these appropriately in data analysis and interpretation in different fields.<br>The learner is able to compute accurately measures of variability and apply these appropriately in data analysis and interpretation in different fields. |

Since standards were changed, learning competencies were changed as well. Look at Figure 2 below.

| Statistics and Probability |
|---|
| **Learning Competencies** |
| • Explains the basic concepts, uses, and importance of statistics |
| • Poses questions and problems that may be answered using statistics |
| • Collects or gathers statistical data and organizes the data in a frequency table according to systematic consideration |
| • Uses appropriate graphs to represent organized data: pie chart, bar graph, line graph, and histogram |

| 4th Quarter |
|---|
| **Statistics and Probability** |
| **Learning Competencies** |
| • Explains the importance of statistics |
| • Poses problems that can be solved using statistics |
| • Gathers statistical data |
| • Organizes data in a frequency distribution table |
| • Uses appropriate graphs to represent organized data: pie chart, bar graph, line graph, histogram, ogive |
| • Illustrates the measures of central tendency (mean, median, mode) of a statistical data |
| • Calculates the measures of central tendency of ungrouped and grouped data |
| • Illustrates the measures of variability (range, average deviation, variance, standard deviation) of a statistical data |
| • Calculates the measures of variability of grouped and ungrouped data |
| • Uses appropriate statistical measures in analyzing and interpreting statistical data |
| • Draws conclusions from graphic and tabular data and measures of central tendency and variability |

**Figure 2:** *Sample Mapping of Learning Competencies from December 2012 Version to December 2013 Version*

From the mapping shown in the previous page, new competencies were included in the December 2013 Curriculum Guide for Grade 7 Statistics and Probability. These competencies are as follows:

CODE: M7SP-IVa-3

- Formulates simple statistical instruments

CODE: M7SP-IVd-e-1

- Uses appropriate graphs to represent organized data: ogive

CODE: M7SP-IVf-1

- Illustrates the measures of central tendency (mean, median, and mode) of a statistical data

CODE: M7SP-IVf-g-1

- Calculates the measures of central tendency of ungrouped data
- Calculates the measures of central tendency of grouped data

CODE: M7SP-IVh-1

- Illustrates the measures of variability (range, average deviation, variance, standard deviation) of a statistical data

CODE: M7SP-IVh-i-1

- Calculates the measures of variability of grouped data
- Calculates the measures of variability of ungrouped data

CODE: M7SP-IVj -1

- Uses appropriate statistical measures in analyzing and interpreting statistical data

CODE: M7SP-IVj-2

- Draws conclusions from measures of central tendency
- Draws conclusions from measures of variability

Curriculum changes are not limited to inclusion of new standards and learning competencies. Some competencies were deleted. Examples are as follows:

- Explains the basic and uses of statistics
- Poses questions that may be answered using statistics

See Appendix 1 for the list of new and deleted standards and learning competencies noted from the December 2013 Curriculum the December 2012 CG Version.

As a summary, the release of December 2013 Curriculum Guide for Mathematics brought changes both in the standards and competencies and the challenge remains the same, for the teachers and other stakeholders to help in the realization of the twin goals of Mathematics Curriculum and, in general, the vision of DepEd's K to 12 Education Program.

For additional information on the changes in Mathematics Curriculum, log on to www.rexinteractive.com.

APPENDIX 1

# List of New and Deleted Standards and Learning Competencies Mathematics Grade 7 (December 2012 vs December 2013 Versions)

## CONTENT STANDARDS

### Number and Number Sense

- The learner demonstrates understanding of key concepts of sets and the real number system. (RETAINED FROM DECEMBER 2012)
- The learner demonstrates understanding of key concepts of the real number system. (RETAINED FROM DECEMBER 2012)

### Measurement

- The learner demonstrates understanding of the key concepts of measurement. (RETAINED FROM DECEMBER 2012 VERSION)

### Patterns and Algebra

- The learner demonstrates understanding of the key concepts of algebraic expression as applied in linear equations in one variable. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of the key concepts of algebraic expression as applied in inequalities in one variable. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of the key concepts of properties of real numbers as applied in linear equations in one variable. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of the key concepts of properties of real numbers as applied in inequalities in one variable. (RETAINED FROM DECEMBER 2012 VERSION)

### Geometry

- The learner demonstrates understanding of the key concepts of geometry of shapes and sizes, and geometric relationships. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of the key concepts of geometric relationships. (RETAINED FROM DECEMBER 2012 VERSION)

**Statistics and Probability**

- The learner demonstrates understanding of the key concepts of statistics. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of uses of statistics. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of importance of statistics. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of data collection/gathering. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of the different forms of data presentation. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner demonstrates understanding of the key concepts measures of central tendency. (NEW IN DECEMBER 2013 VERSION)
- The learner demonstrates understanding of the key concepts measures of variability. (NEW IN DECEMBER 2013 VERSION)
- The learner demonstrates understanding of the key concepts of probability. (NEW IN DECEMBER 2013 VERSION)

## PERFORMANCE STANDARDS

**Number and Number Sense**

- The learner is able to formulate challenging situations involving sets and solve these in a variety of strategies. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner is able to formulate challenging situations involving real numbers and solve these in a variety of strategies. (RETAINED FROM DECEMBER 2012 VERSION)

**Measurement**

- The learner is able to formulate real-life problems involving measurements and solve these using a variety of strategies. (RETAINED FROM DECEMBER 2012 VERSION)

**Patterns and Algebra**

- The learner is able to model situations using oral, written, graphical, and algebraic methods in solving problems involving algebraic expressions, linear equations, and inequalities in one variable. (RETAINED FROM DECEMBER 2012 VERSION)

**Geometry**

- The learner is able to create models of plane figures. (RETAINED FROM DECEMBER 2012 VERSION)

- The learner is able to formulate authentic problems involving sides and angles of a polygon. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner is able to formulate authentic problems involving angles of a polygon. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner is able to solve accurately authentic problems involving sides of a polygon. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner is able to solve accurately authentic problems involving angles of a polygon. (RETAINED FROM DECEMBER 2012 VERSION)

**Statistics and Probability**

- The learner is able to collect data systematically and apply these appropriately in data analysis and interpretation in different fields. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner is able to organize data systematically and apply these appropriately in data analysis and interpretation in different fields. (RETAINED FROM DECEMBER 2012 VERSION)
- The learner is able to compute accurately measures of central tendency and apply these appropriately in data analysis and interpretation in different fields. (NEW IN THE DECEMBER 2013 VERSION)
- The learner is able to compute accurately measures of variability and apply these appropriately in data analysis and interpretation in different fields. (NEW IN THE DECEMBER 2013 VERSION)

## LEARNING COMPETENCIES

### I. Number and Number Sense

New Competencies in the December 2013 Curriculum Guide

CODE: M7NS-Ia-2

- Illustrates the union of sets
- Illustrates the intersection of sets
- Illustrates the difference of two sets

CODE: M7NS-Ic-1

- Represents the absolute value of a number on a number line as distance of a number from zero

CODE: M7NS-Ig-3

- Estimates the square root of a whole number to the nearest hundredth

CODE: M7NS-lg-4

- Plots irrational numbers (up to square roots) on a number line

CODE: M7NS-lh-1

- Illustrates the different subsets of real numbers

Deleted Competencies from the December 2012 Curriculum Guide

- Describes the union of sets
- Describes the intersection of sets
- Describes the complement of a set
- Describes the absolute value of a number on a number line as distance of a number from zero
- Illustrates the absolute value of a number on a number line as distance of a number from zero
- States the different properties of operations on the set of integers
- Estimates the square root of a whole number to the nearest tenth
- Illustrates irrational numbers (square roots) on a number line with and without technology
- Graphs irrational numbers (square roots) on a number line with and without technology
- Describes the different subsets of real numbers
- Represents the different subsets of real numbers
- Compares the different subsets of real numbers
- Finds the union of the sets of real numbers and their subsets
- Finds the intersection of the sets of real numbers and their subsets
- Finds the complement of the sets of real numbers and their subsets
- Determines significant digits in a given situation
- Describes real-life situations which involve integers, rational numbers, square root of rational and irrational numbers

**II. Measurement**

New Competencies in the December 2013 Curriculum Guide

CODE: M7ME-IIa-1

- Illustrates what it means to measure

CODE: M7ME-IIa-3

- Approximates the measures of quantities particularly rate

Deleted Competencies from the December 2012 Curriculum Guide

- Uses appropriate instruments to measure quantities particularly length, weight/mass, volume, time, angle, and temperature

**III. Patterns and Algebra**

New Competencies in the December 2013 Curriculum Guide

CODE: M7AL-IId-1

- Classifies algebraic expressions which are polynomials according to degree and number of terms

CODE: M7AL-IIg-2

- Solves problems involving algebraic expressions

CODE: M7AL-IIh-1

- Differentiates between algebraic expressions and equations

CODE: M7AL-IIh-4

- Illustrates linear equation and inequality in one variable

CODE: M7AL-IIj-2

- Solves problems involving equations and inequalities in one variable

Deleted Competencies from the December 2012 Curriculum Guide

- Differentiates between constants and variables in a given algebraic expression
- Gives examples of algebraic expressions which are polynomials and classifies these as to number of terms
- Differentiates between mathematical expressions and mathematical equations
- Finds the solution of an equation or inequality involving one variable, including one that involves absolute value from a given replacement set
- Finds the solution of an equation or inequality involving one variable, including one that involves absolute value intuitively by guess and check

## IV. Geometry

New Competencies in the December 2013 Curriculum Guide

CODE: M7GE-IIIa-1

- Represents point, line, and plane using concrete and pictorial models

CODE: M7GE-IIIa-2

- Illustrates subsets of a line

CODE: M7GE-IIIe-2

- Illustrates polygons: convexity
- Illustrates polygons: angles
- Illustrates polygons: sides

CODE: M7GE-IIIg-1

- Illustrates a circle and terms related to it: chord
- Illustrates a circle and terms related to it: inscribed angle

CODE: M7GE-IIIh-i-1

- Constructs triangles
- Constructs squares
- Constructs rectangles
- Constructs regular pentagons
- Constructs regular hexagons

CODE: M7GE-IIIj-1

- Solves problems involving sides of a polygon
- Solves problems involving angles of a polygon

Deleted Competencies from the December 2012 Curriculum Guide

- Presents point, line, and plane using concrete and pictorial models
- Illustrates the different kinds of angles
- Classifies triangles according to their angles and according to their sides
- Illustrates and names different kinds of triangles
- Derives relationships among the sides and angles of a triangle using measurement and inductive reasoning
- Illustrates and names different kinds of quadrilaterals

- Derives relationship among the sides and angles of a quadrilateral using measurement and inductive reasoning
- Illustrates convex polygons
- Derives relationship of exterior and interior angles of any convex polygon using measurement

**V. Statistics and Probability**

New Competencies in the December 2013 Curriculum Guide

CODE: M7SP-IVa-3

- Formulates simple statistical instruments

CODE: M7SP-IVd-e-1

- Uses appropriate graphs to represent organized data: ogive

CODE: M7SP-IVf-1

- Illustrates the measures of central tendency (mean, median, and mode) of a statistical data

CODE: M7SP-IVf-g-1

- Calculates the measures of central tendency of ungrouped data
- Calculates the measures of central tendency of grouped data

CODE: M7SP-IVh-1

- Illustrates the measures of variability (range, average deviation, variance, standard deviation) of a statistical data

CODE: M7SP-IVh-i-1

- Calculates the measures of variability of grouped data
- Calculates the measures of variability of ungrouped data

CODE: M7SP-IVj -1

- Uses appropriate statistical measures in analyzing and interpreting statistical data

CODE: M7SP-IVj-2

- Draws conclusions from measures of central tendency
- Draws conclusions from measures of variability

Deleted Competencies from the December 2012 Curriculum Guide

- Explains the basic and uses of statistics
- Poses questions that may be answered using statistics

For other grade levels, log on to www.rexinteractive.com.

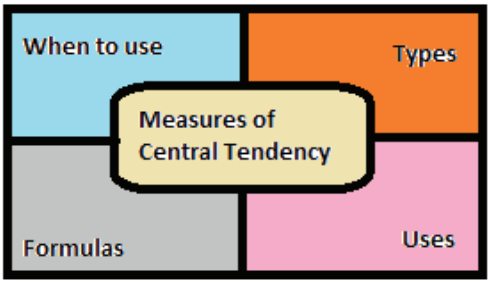
# APPENDIX 2

## Sample Supplemental Lesson

**Measures of Central Tendency of Grouped Data**

**Introduction:**

1. Assess students' prior knowledge on measures of central tendencies of grouped data by asking them to fill out the Frayer Model below.




2. Ask them to share their answers to a partner.

**Body:**

1. Review how to get the mean, median, and mode of ungrouped data.
2. Facilitate a discussion on how to find the mean, median, and mode of a grouped data.

In general, a set of data $\mathbf{x_1}$, $\mathbf{x_2}$, $\mathbf{x_3}$,…,$\mathbf{x_n}$, with the corresponding frequencies $\mathbf{f_1}$, $\mathbf{f_2}$, $\mathbf{f_3}$,…, $\mathbf{f_n}$

**Mean of Grouped Data**

$$Mean = \frac{\sum fx}{\sum f}$$

**Median of Grouped Data**

$$Median = L + \frac{\left(\frac{n}{2}\right) - cf_b}{f_m} x\ w$$

**Knowledge:**

- Measures of Central Tendency of Grouped Data

**Learning Competencies:**

M7SP-IVf-g-1

- Calculates the measures of central tendency for grouped data

M7SP-IVj-1

- Uses appropriate statistical measures in analyzing and interpreting data

M7SP-IVj-2

- Draws conclusion from measures of central tendency

- L is the lower class boundary of the group containing the median
- n is the total number of data
- $c_{fb}$ is the cumulative frequency of the groups before the median group
- $f_m$ is the frequency of the median group
- w is the group width

**Mode of Grouped Data**

$$Mode = L + \frac{f_m - f_{m-1}}{(f_m - f_{m-1}) + (f_m - f_{m+1})} x\ w$$

- L is the lower boundary of the modal group
- $f_{m-1}$ is the frequency of the group before the modal group
- fm is the frequency of the modal group
- $f_{m+1}$ is the frequency of the group afer the modal group
- w is the group width

Processing Questions:

a. What are the formulas for computing the mean, median, and mode?

b. What additional information are needed when calculating the measures of central tendency for grouped data?

c. Is it possible to obtain equal mean, median, and mode for a given set of data?

d. In what instances do we apply the measures of central tendency?

3. Discuss illustrative examples to class to demonstrate the steps in calculating the mean, median, and mode of grouped data.

**Key Understanding:**

There are various mathematical means for reaching "fair" decisions and there are many real-world situations which utilize statistical analysis.

**Key Question:**

How can mathematics help us with decision making (e.g. grading, voting)?

**Points of Integration:**

- Central Tendency for Ungrouped data
- Summation

**21st Century Skill:**

- Decision Making

Example: Andrea made a survey on the number of books read by her classmates last summer break and obtained the following data:

9, 15, 11, 12, 3, 5, 10, 20, 15, 16, 7, 8, 18, 6, 7, 4, 2, 11, 3, 11

Estimate the median and mode of the data gathered by Andrea.

4. Using spin-off Pairs Check (Kagan, 1998), let the students perform a Do-Now activity on calculating the measures of central tendency for grouped data.
   - Establish pairs of students.
   - Give each pair a set of problems.
   - Person 1 does the first problem, while person 2 acts as a coach. When they agree on the solution, they move to the next problem.
   - Person 2 does the second problem, while person 1 acts as a coach. They agree on the solution.
   - They then check the first two problems with another pair. All four students work to agree on the solution of the first two problems.
   - Repeat steps 3–5 until all problems are solved.
5. For enrichment, let the students choose one task from the following:
   a. Write a letter to a friend about the measures of central tendency of grouped data and the instances where each of the measure is best used. Indicate also the advantages and disadvantages of each measure.
   b. Facilitate a group/panel discussion on measures of central tendency of grouped data and when to use them. Include also in the discussion the pros and cons of each measure.

Differentiated Activities

c. Make an advertisement promoting or introducing the measures of central tendency of grouped data, and then make a report to your teacher about the advantages and disadvantages of each measure.

**Conclusion:**

To facilitate the summary of the lesson, ask the students to review and revise, if necessary, their entries in the Frayer Model.

As a concluding activity, conduct a spin-off 3-2-1 activity (Rutherford, 2008). Ask the students to identify:

- 3 important concepts that really interest them
- 2 questions they want to ask
- 1 idea that needs clarification