Math Grade 3
Assessment Anchors
and Eligible Content

Pennsylvania Department of Education

Updated August 2010

M3.A Numbers and Operations

ASSESSMENT ANCHOR

M3.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

	ELIGIBLE CONTENT
M3.A.1.1 Apply place-value concepts and numeration to counting, ordering, grouping and equivalency.	**M3.A.1.1.1** Match the word name with the appropriate whole number (up through 9,999).
	M3.A.1.1.2 Differentiate between and/or give examples of even and odd number (limit to 3 digits).
	M3.A.1.1.3 Compare two whole numbers using greater than (>), less than (<) or equal to (=) (up through 9,999).
	M3.A.1.1.4 Order a set of whole numbers from least to greatest or greatest to least (up through 9,999; limit sets to no more than four numbers).
	M3.A.1.1.5 Match a symbolic representation of numbers to appropriate whole numbers (e.g., base ten blocks, 7 hundreds, 4 tens and 8 ones, etc).

EXAMPLE ITEMS

- Jake is 47 inches tall. Mike is 39 inches tall. Which of the following correctly compares the height of each child.

    A. 39 > 47
    B. 39 = 47
    C. 47 < 39
  * D. 47 > 39

(New Jersey Department of Education)

Reference:

2.1.3.B   Represent **equivalent forms** of the same number through the use of concrete objects, drawings, word names, and symbols.

2.1.3.D   Apply place value concepts and base-ten numeration to order and compare whole numbers.

2.1.3.A   Apply **one-to-one correspondence** and number **patterns** to count up and count back and to compare values of whole numbers and values of money.

2.1.3.C   Use drawings, diagrams or **models** to show the concept of fraction as part of a whole.

2.2.3.B   Add and subtract single- and double-digit numbers with regrouping and triple-digit numbers, without regrouping including problems with money.

2.11.3.A. Identify whole number quantities and measurements from least to most and greatest value.

M3.A Numbers and Operations | Reporting Category

ASSESSMENT ANCHOR

M3.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

ELIGIBLE CONTENT

M3.A.1.2 Use fractions to represent quantities as part of a whole or part of a set.

M3.A.1.2.1 Write the fraction that corresponds to a drawing or part of a set (numerators 1-9, denominators 2-10. No equivalent or improper fractions or mixed numbers).

M3.A.1.2.2 Create a drawing or set that represents a given fraction (numerators 1-9, denominators 2-10. No equivalent or improper fractions or mixed numbers).

EXAMPLE ITEMS

- Which drawing below correctly represents one-fourth?

A

* B

C

D
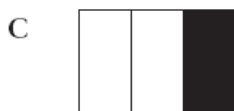
(Nevada Department of Education)

Reference:

2.1.3.C Use drawings, diagrams or **models** to show the concept of fraction as part of a whole.

2.1.3.A Apply **one-to-one correspondence** and number **patterns** to count up and count back and to compare values of whole numbers and values of money.

2.1.3.B Represent **equivalent forms** of the same number through the use of concrete objects, drawings, word names, and symbols.

2.1.3.D Apply place value concepts and base-ten numeration to order and compare whole numbers.

2.2.3.B Add and subtract single- and double-digit numbers with regrouping and triple-digit numbers, without regrouping including problems with money.

2.11.3.A. Identify whole number quantities and measurements from least to most and greatest value.

M3.A Numbers and Operations   Reporting Category

ASSESSMENT ANCHOR

M3.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

	ELIGIBLE CONTENT
M3.A.1.3 Count, compare and make change using a collection of coins and one-dollar bills.	**M3.A.1.3.1** Count a collection of bills and coins less than $5.00 (penny, nickel, dime, quarter, dollar). Money may be represented as 15 cents, 15¢ or $0.15.
	M3.A.1.3.2 Compare total values of combinations of coins less than $5.00 (penny, nickel, dime, quarter, dollar).
	M3.A.1.3.3 Make change for an amount up to $5.00 with no more than $2.00 change given (penny, nickel, dime, quarter, dollar).

EXAMPLE ITEMS

- Carmen bought a soda that cost 65 ¢ . Which coins could she use to pay for the soda?

(New Hampshire Department of Education)

M3.A Numbers and Operations   Reporting Category

Reference:

2.2.3.B   Add and subtract single- and double-digit numbers with regrouping and triple-digit numbers, without regrouping including problems with money.

2.1.3.A   Apply **one-to-one correspondence** and number **patterns** to count up and count back and to compare values of whole numbers and values of money.

2.1.3.B   Represent **equivalent forms** of the same number through the use of concrete objects, drawings, word names, and symbols.

2.1.3.C   Use drawings, diagrams or **models** to show the concept of fraction as part of a whole.

2.1.3.D   Apply place value concepts and base-ten numeration to order and compare whole numbers.

2.11.3.A. Identify whole number quantities and measurements from least to most and greatest value.

M3.A Numbers and Operations Reporting Category

ASSESSMENT ANCHOR

M3.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.

	ELIGIBLE CONTENT
M3.A.2.1 Understand various meanings of operations and the relationship between them.	**M3.A.2.1.1** Represent multiplication as repeated addition.
	M3.A.2.1.2 Demonstrate the inverse relationship between addition and subtraction using fact families and/or factors.
	M3.A.2.1.3 Identify the correct operation(s) to solve a word problem (no more than 2 operations using +, - and/or X).

EXAMPLE ITEMS

- Which expression is **not** the same as 3 x 5?

  F. 5 x 3
  *G. 5 x 5 x 5
  H. 5 + 5 + 5
  J. 3 + 3 + 3 + 3 + 3

  (New York State Department of Education)

- The ☐ and △ stand for numbers in the fact family below.

$$☐ + △ = 15$$
$$△ + ☐ = 15$$
$$15 - ☐ = △$$
$$15 - △ = ☐$$

  The ☐ and △ could stand for which two numbers?

  A. ☐ = 6 and △ = 8
  *B. ☐ = 6 and △ = 9
  C. ☐ = 7 and △ = 9
  D. ☐ = 8 and △ = 9

  (New Hampshire Department of Education)

- Ed and Jeanne each have 15 lion stickers. Tammy has 20. Which process could they use to find out how many they have altogether?

  A. Add 15 and 20.
  B. Multiply 15 and 20.
  C. Add 15 and 20, then multiply by 2.
  *D. Multiply 15 by 2; then add 20.

  (Louisiana Department of Education)

M3.A Numbers and Operations   Reporting Category

Reference:

2.2.3.A   Develop **fluency** in the use of basic facts for the four operations.

2.5.3.A   Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts.

2.1.3.F   Understand the concepts of addition and subtraction and use the **inverse** relationships between addition and subtraction to determine unknown quantities in **equations**.

M3.A Numbers and Operations — Reporting Category

ASSESSMENT ANCHOR

M3.A.3 Compute accurately and fluently and make reasonable estimates.

	ELIGIBLE CONTENT
M3.A.3.1 Solve problems using addition, subtraction and multiplication (straight computation and word problems).	**M3.A.3.1.1** Solve single- and double- digit addition and subtraction problems with and without regrouping in vertical or horizontal form.
	M3.A.3.1.2 Solve problems involving multiplication through the 9's tables through 9x5.
	M3.A.3.1.3 Solve triple digit addition and subtraction problems without regrouping in vertical or horizontal form.

EXAMPLE ITEMS

- To order a free soccer ball, Cody needs 60 points. He has 27 points. How many more points does he need?

  * A. 33
    B. 43
    C. 47
    D. 87

  (New Hampshire Department of Education)

- In Ms. May's room there are 4 rows of desks with 5 desks in each row. How many desks are in Ms. May's room?

    A.   9
    B. 16
  * C. 20
    D. 25

  (New Hampshire Department of Education)

Reference:

2.2.3.A   Develop **fluency** in the use of basic facts for the four operations.

2.2.3.B   Add and subtract single- and double-digit numbers with regrouping and triple-digit numbers, without regrouping including problems with money.

2.2.3.D   Estimate values, sums, and differences of quantities and conclude the **reasonableness** of those estimates.

M3.A Numbers and Operations   Reporting Category

ASSESSMENT ANCHOR

M3.A.3 Compute accurately and fluently and make reasonable estimates.

	ELIGIBLE CONTENT
M3.A.3.2 Use estimation skills to arrive at conclusions.	**M3.A.3.2.1** Estimate sums and differences of quantities; round 2-digit numbers to the nearest 10, and 3 digit numbers to the nearest 100, before computing (limit to two numbers).

EXAMPLE ITEMS

- Elena worked 62 hours in April, and 59 hours in May. Which of these is the BEST estimate of the total number of hours she worked for the two months?

   A. 50 + 50
   B. 55 + 55
 * C. 60 + 60
   D. 65 + 65

(Adapted from TIMSS)

Reference:

2.2.3.D   Estimate values, sums, and differences of quantities and conclude the **reasonableness** of those estimates.

2.2.3.A   Develop **fluency** in the use of basic facts for the four operations.

2.2.3.B   Add and subtract single- and double-digit numbers with regrouping and triple-digit numbers, without regrouping including problems with money.

M3.B Measurement   Reporting Category

ASSESSMENT ANCHOR

M3.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

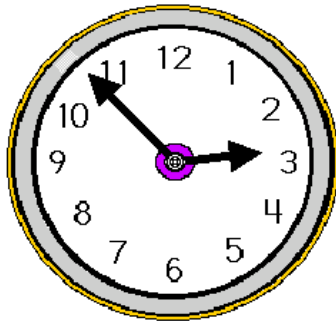|	**ELIGIBLE CONTENT**
M3.B.1.1 Determine or calculate time and elapsed time.	**M3.B.1.1.1** Tell/show time (analog) to the minute.
	M3.B.1.1.2 Find elapsed time to increments of 5 minutes (limited to 2 adjacent hours).
	M3.B.1.1.3 Identify times of the day and night as AM and PM.

EXAMPLE ITEMS

- Look at the clock below.

What time is shown on the clock?

    A. 2:46

    B. 2:48

 * C. 2:53   *(Maryland State Department of Education)*

    D. 3:07

What time is shown on the clock?

-

 * A. 4:41

    B. 5:41

    C. 8:23

    D. 8:25

(Nevada Department of Education)

Reference:

2.3.3.C Tell time on an **analog** and digital clock, identify times of day and night as a.m. and p.m., and calculate elapsed time.

2.3.3.D Identify **equivalent** measurements within the same system.

2.3.3.A Demonstrate an understanding of measurable characteristics and the need to quantify those characteristics.

M3.B Measurement | Reporting Category

ASSESSMENT ANCHOR

M3.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

	ELIGIBLE CONTENT
M3.B.1.2 Use the attributes of length, area, volume and weight of objects.	**M3.B.1.2.1** Select an appropriate unit for the attribute being measured.
	M3.B.1.2.2 Compare and/or order objects according to length, area, or weight.

EXAMPLE ITEMS

Reference:

2.3.3.A Demonstrate an understanding of measurable characteristics and the need to quantify those characteristics.

2.3.3.D Identify **equivalent** measurements within the same system.

2.3.3.C Tell time on an **analog** and digital clock, identify times of day and night as a.m. and p.m., and calculate elapsed time.

M3.B Measurement   **Reporting Category**

ASSESSMENT ANCHOR

M3.B.2 Apply appropriate techniques, tools and formulas to determine measurements.

ELIGIBLE CONTENT

M3.B.2.1 Determine the measurement of objects with non-standard and standard units.

M3.B.2.1.1 Use a ruler (provided) to measure to the nearest ½ inch.

EXAMPLE ITEMS

Reference:

2.3.3.B   Identify a measurable characteristic of an object, select an appropriate standard or non-standard unit of measure and tool, and determine the measurement to a specified level of accuracy.

2.3.3.F   Estimate and verify measurements of length, area, weight, and capacity.

M3.B Measurement

ASSESSMENT ANCHOR

M3.B.2 Apply appropriate techniques, tools and formulas to determine measurements.

	ELIGIBLE CONTENT
M3.B.2.2 Estimate measurements of familiar objects.	**M3.B.2.2.1** Match the object with its approximate measurement (all measurements given must be of the same system, e.g., about how tall is a soda pop can? 5 inches, 5 feet, 5 yards, etc.).

EXAMPLE ITEMS

Reference:

2.3.3.F   Estimate and verify measurements of length, area, weight, and capacity.

M3.C Geometry   **Reporting Category**

ASSESSMENT ANCHOR

M3.C.1 Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.
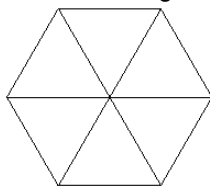
	ELIGIBLE CONTENT
M3.C.1.1 Identify and/or describe two- and three-dimensional objects.	**M3.C.1.1.1** Name/identify/describe geometric shapes in two dimensions (circle, square, rectangle, triangle, pentagon, hexagon, octagon).
	M3.C.1.1.2 Name/identify geometric shapes in three dimensions (sphere, cube, cylinder, cone, pyramid, rectangular prism).

EXAMPLE ITEMS

- Here is a hexagon.

  The hexagon is divided into six

  * A. triangles
  B. squares
  C. pentagons
  D. rectangles   *(TIMSS)*

- If Carl connects the points shown below with line segments, what shape will he make?
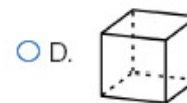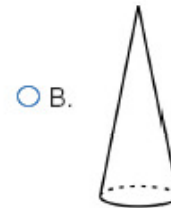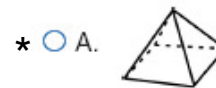
  .Y

  X.

  .Z

  * A. triangle
  B. square
  C. rectangle
  D. hexagon

  (New Hampshire Department of Education)

- Which shape is a pyramid?

  * ○ A.

  ○ B.

  ○ C.

  ○ D.

  (New Hampshire Department of Education)

Reference:

2.9.3.A Name, describe and draw/build 2- and 3-dimensional shapes.

M3.C Geometry   **Reporting Category**

ASSESSMENT ANCHOR

M3.C.2 Identify and/or apply concepts of transformations or symmetry.
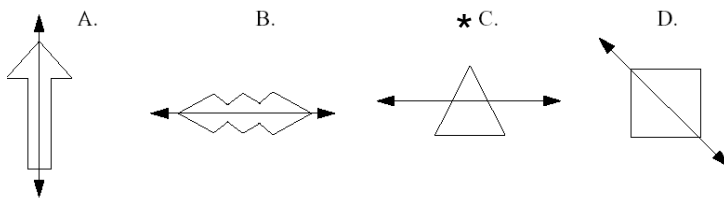
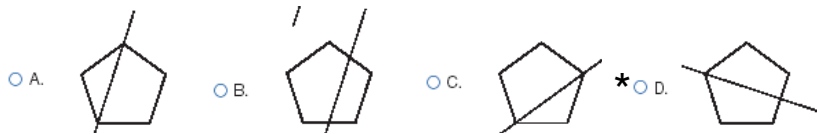|	**ELIGIBLE CONTENT**
M3.C.2.1 Apply the concepts of transformations and symmetry.	**M3.C.2.1.1** Identify/draw one line of symmetry in a two-dimensional figure.
	M3.C.2.1.2 Identify symmetrical two-dimensional shapes.

EXAMPLE ITEMS

- Which of these does NOT show a line of symmetry?

A.   B.   ★ C.   D.

- In which figure below is a line of symmetry shown?

○ A.   ○ B.   ○ C.   ★ ○ D.

(TIMSS)

(New Hampshire Department of Education)

Reference:

2.9.3.B   Identify and draw lines of **symmetry**.

M3.C Geometry   **Reporting Category**

ASSESSMENT ANCHOR

M3.C.3 Locate points or describe relationships using the coordinate plane.

ELIGIBLE CONTENT

Not assessed at Grade 3.

EXAMPLE ITEMS

M3.D Algebraic Concepts	**Reporting Category**

ASSESSMENT ANCHOR

M3.D.1 Demonstrate an understanding of patterns, relations and functions.

ELIGIBLE CONTENT

M3.D.1.1 Recognize, describe, or extend a variety of patterns.

M3.D.1.1.1 Extend or find a missing element in a pattern of numbers or shapes (pattern must show 3 repetitions – if multiples are used, limit to 2, 3 or 5).

M3.D.1.1.2 Identify/describe the rule for a pattern shown (pattern must show 3 repetitions – if multiples are used, limit to 2, 3 or 5).

EXAMPLE ITEMS

- Use the number pattern below to answer the question.

  0, 1, 3, 6, 10, 15, ?

  Which number is next in this pattern?
  A. 30
  ∗ B. 21
  C. 20
  D. 16

  (New Hampshire Department of Education)

- If this pattern continues, what is the next number?

  4, 7, 10, 13, 16, 19, . . .

  A. 21
  ∗ B. 22
  C. 23
  D. 24

  (New Jersey Department of Education)

- Which rule below best describes this skip counting pattern?

  100, 95, 90, 85, 80, 75, 70, 65, . . .

  A. Add 5 to each number to get the next number.
  ∗ B. Subtract 5 from each number to get the next number.
  C. Multiply each number by 5 to get the next number.
  D. Divide each number by 5 to get the next number.

  (Nevada Department of Education)

Reference:

2.8.3.C Recognize, describe, extend, create, and replicate a variety of **patterns** including attribute, activity, number, and geometric **patterns**.

2.8.3.D Use a rule to find a missing value and determine a rule for a given **pattern**.

M3.D Algebraic Concepts   Reporting Category

ASSESSMENT ANCHOR

M3.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.

M3.D.2.1 Create/model expressions, equations and inequalities to match a problem situation.	**ELIGIBLE CONTENT**
	M3.D.2.1.1 Create or match a story to a given combination of symbols (+, −, x, <, >, =) and numbers.
	M3.D.2.1.2 Choose the number sentence that matches a given story (one operation, + or − only).

EXAMPLE ITEMS

- Kamala bought a box of crayons for 29¢. She also bought a coloring book for 65¢. Which number sentence shows how much money Kamala spent on the crayons and coloring book?

    A.   65¢ - 29¢ = ____

    B.   ____ + 29¢ = 65¢

  ∗ C.   29¢ + 65¢ = ____

    D.   65¢ + ____ = 29¢   *(New Jersey Department of Education)*

Reference:

2.8.3.E   Use concrete objects or combinations of symbols and numbers to represent **expressions, equations,** and **inequalities** that model mathematical situations.

2.8.3.B   Use concrete objects and trial and error to solve number sentences (**equations** and **inequalities**).

2.8.3.D   Use a rule to find a missing value and determine a rule for a given **pattern**.

M3.D Algebraic Concepts — Reporting Category

ASSESSMENT ANCHOR

M3.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.

	ELIGIBLE CONTENT
M3.D.2.2 Determine the missing number or symbol in a number sentence.	**M3.D.2.2.1** Find a missing number that makes a number sentence true (1-digit or 2-digit numbers up to 18 using +, - or x through 9 x 5).
	M3.D.2.2.2 Identify the missing symbol (+, -, =, <, >) that makes a number sentence true.

EXAMPLE ITEMS

- Which symbol below should go in the box to make this number sentence true?

  20 – 17 ☐ 10 – 7

  A.   +
  B.   >
  C.   <
  * D.   =

  (Nevada Department of Education)

Reference:

2.8.3.B   Use concrete objects and trial and error to solve number sentences (**equations** and **inequalities**).

2.8.3.D   Use a rule to find a missing value and determine a rule for a given **pattern**.

2.8.3.E   Use concrete objects or combinations of symbols and numbers to represent **expressions, equations,** and **inequalities** that model mathematical situations.

M3.D Algebraic Concepts   Reporting Category

ASSESSMENT ANCHOR

M3.D.3 Analyze change in various contexts.

ELIGIBLE CONTENT

Not assessed at Grade 3.

EXAMPLE ITEMS

M3.D Algebraic Concepts — Reporting Category

ASSESSMENT ANCHOR

M3.D.4 Describe or use models to represent quantitative relationships.

ELIGIBLE CONTENT

Not assessed at Grade 3.

EXAMPLE ITEMS

M3.E Data Analysis and Probability   **Reporting Category**

ASSESSMENT ANCHOR

M3.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.
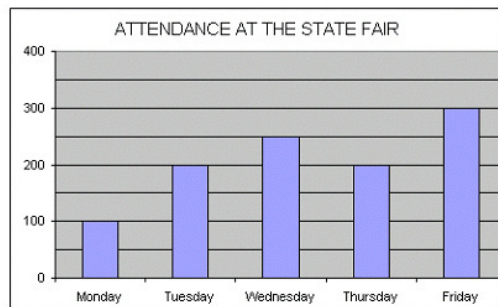
	ELIGIBLE CONTENT
M3.E.1.1 Answer questions based on data shown on tables, charts, and bar graphs.	**M3.E.1.1.1** Analyze data shown on tables, charts, or bar graphs using the concepts of largest, smallest, most often, least often and middle.
	M3.E.1.1.2 Describe, interpret and/or answer questions based on data shown in tables, charts or bar graphs.

EXAMPLE ITEMS

The graph above shows the number of tickets sold for the first five days of the week. How many tickets were sold on the third day of the week?

     A. 100
     B. 150
     C. 200
   ⋆ D. 250

(New Jersey Department of Education)

Reference:

2.6.3.C   Describe data displayed in a diagram **(e.g., Venn)** a graph or a table.

2.6.3.D   Analyze data shown in tables, charts, diagrams, and graphs; compare the data from two categories displayed in a graph and compare representations of a set of data in different graphs.

2.6.3.E   Determine the **reasonableness** of a statement based on a comparison to data displayed in a graph.

2.6.3.B   Organize and display data using pictures, tallies, charts, bar graphs and pictographs.

2.7.3.D   List or graph the possible results of an experiment.

M3.E Data Analysis and Probability   Reporting Category

ASSESSMENT ANCHOR

M3.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.

	ELIGIBLE CONTENT
M3.E.1.2 Organize or display data using tables, charts, bar graphs.	**M3.E.1.2.1** Graph data or complete a graph given the data (grid is provided).
	M3.E.1.2.2 Translate information from one type of display to another (e.g., convert tally chart to bar graph). Limit to tally charts, bar graphs and tables.

EXAMPLE ITEMS

- Tom asked several friends if they had read his favorite book, *Superfudge*. This is the data he collected.

yes	no	yes	yes
yes	yes	no	no
no	no	yes	no
yes	yes	no	yes

Answer	Tally	Number
No	||||‾ | |	7
Yes		

Tom recorded the NO answers in the chart above. What should he enter in the YES tally column of his chart?

A. ||||‾

B. ||||‾ \| \|

C. ||||‾ ||||‾

★ D. ||||‾ \| \| \| \|

(New Hampshire Department of Education)

Reference:

2.6.3.B Organize and display data using pictures, tallies, charts, bar graphs and pictographs.

2.6.3.D Analyze data shown in tables, charts, diagrams, and graphs; compare the data from two categories displayed in a graph and compare representations of a set of data in different graphs.

2.7.3.D List or graph the possible results of an experiment.

2.6.3.E Determine the **reasonableness** of a statement based on a comparison to data displayed in a graph.

M3.E Data Analysis and Probability   Reporting Category

ASSESSMENT ANCHOR

M3.E.2 Select and/or use appropriate statistical methods to analyze data.

ELIGIBLE CONTENT

Not assessed at Grade 3.

EXAMPLE ITEMS

M3.E Data Analysis and Probability   Reporting Category

ASSESSMENT ANCHOR

M3.E.3 Understand and/or apply basic concepts of probability or outcomes.

ELIGIBLE CONTENT

Not assessed at Grade 3.

EXAMPLE ITEMS

M3.E Data Analysis and Probability   Reporting Category

ASSESSMENT ANCHOR

M3.E.4 Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.

ELIGIBLE CONTENT

Not assessed at Grade 3.

EXAMPLE ITEMS