DEPARTMENT OF EDUCATION

Benchmark Achievement Level Descriptors (Benchmark ALDs)

Overview and Purpose

The development of Achievement Level Descriptors (ALDs) is a critical step in communicating student performance in terms of levels or categories of performance on any standardized assessment. For Minnesota Comprehensive Assessments (MCAs), ALDs are developed in collaboration with educators during the first year of full implementation. The ALDs provide a description of grade-level student performance on MCAs for each of the achievement levels of Exceeds the Standards, Meets the Standards, Partially Meets the Standards, and Does Not Meet the Standards. These statements are included on a student's MCA score report to aid families in score interpretation. More detail regarding the development of the MCA Achievement Level Descriptors is on Testing 1, 2, 3.

Over the years, educators have requested more specific descriptions of the knowledge, skills and abilities of students who typically score in each of the different MCA achievement levels beyond what the traditional ALDs offer. In response to this need, Minnesota Department of Education (MDE) staff collaborated to outline more specific descriptions, the Benchmark ALDs for Mathematics and Reading. The purpose of Benchmark ALDs is to

1. promote equity for all students across the state by clarifying expected learning outcomes for instruction and local assessment of Minnesota Academic Standards in Reading and Mathematics; and
2. support teachers' analysis of the depth of their curriculum, instruction and classroom assessments.

The Mathematics and Reading Benchmark ALDs were developed by

- reviewing test questions and test data for all operational MCA III questions, in many cases 800–1,000 questions per grade;
- grouping items within each benchmark based on student performance on the items relative to their overall performance on the MCAs; and
- reviewing the achievement level groupings of questions within each benchmark for commonalities in the skills, understanding and context needed to correctly answer the items. Each Benchmark ALD describes some of the skills typically demonstrated by students whose overall performance on the MCAs is at that achievement level. These skills are in addition to the descriptions at the lower achievement levels.

Released Examples

Where possible, released examples that illustrate skills described in the benchmark and achievement level are listed in the document. To view examples, click on "Released Example" in the Benchmark ALD tables or go to the Minnesota Question Tool (https://public.education.mn.gov/nqt/). Once at the Minnesota Question Tool (MQT) site, you can enter or copy and paste the released example identification number into the "Search by Question ID" field. Note that within the MQT you can find additional questions that are aligned to the academic standards but are not specifically listed in the Benchmark ALD tables.

Example items are not currently available for all benchmarks and achievement levels in the Benchmark ALD tables. MDE will update the document as more released examples become available.

Training Module

Watch the training module to learn how to use the Benchmark ALDs to evaluate the rigor of classroom assessments and instructional materials: https://testing123.education.mn.gov/test/plan/success/.

This module will help educators understand how the Benchmark ALDs can be used to facilitate the learning outcomes defined in the Minnesota K–12 Academic Standards in Mathematics and Reading and to evaluate the rigor of classroom assessment and instruction.

Grade 3 Mathematics Benchmark Achievement Level Descriptors

Number & Operation

Compare and represent whole numbers up to 100,000 with an emphasis on place value and equality. (3.1.1)

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3.1.1.1 **Read, write and represent whole numbers up to 100,000. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives such as bundles of sticks and base 10 blocks.**	Identifies whole numbers up to 10,000 written as symbols (numerals) and words Understands expanded notation (symbolic expressions with operations) at a basic level Identifies a number, up to 500, a set of base 10 blocks represents a number less than 10,000 (rote use) **Released Examples:** 232346, 233067	Translates between symbol and word representations of whole numbers up to 100,000 Translates between symbol and word representations of expressions containing whole numbers up to 10,000 **Released Example:** 236060	Consistently represents whole numbers up to 100,000 using both symbols and words Compares and represents deconstructed expressions in symbols and words containing whole numbers up to 100,000 **Released Example:** 232201	Consistently translates between various representations of whole numbers up to 100,000 Interprets models based on unit sizes **Released Examples:** 234821, 235502

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3.1.1.2 **Use place value to describe whole numbers between 1000 and 100,000 in terms of ten thousands, thousands, hundreds, tens and ones.**	Translates between symbol and expanded representations of whole numbers up to 10,000 Matches digits to place value names or values when provided **Released Examples:** 230030, 234127	Translates between symbol and expanded representations of whole numbers up to 50,000 Uses place value names when solving simple mathematical problems **Released Examples:** 232221, 234128	Translates between symbol and expanded representations of whole numbers up to 100,000 Recognizes place value of digits in real-world contexts	Translates between written and expanded representations of whole numbers up to 100,000 **Released Example:** 234819

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3.1.1.3 **Find 10,000 more or 10,000 less than a given five-digit number. Find 1000 more or 1000 less than a given four- or five-digit number. Find 100 more or 100 less than a given four- or five-digit number.**	Finds 100 more than 4-digit numbers **Released Example:** 234114	Finds 1000 more or less than 4-digit numbers Finds 100 or 10,000 more or less than 5-digit numbers Understands that decimal points cannot be used in place of a comma (e.g., 13,405 ≠ 13.405)	Finds 100 and 1000 more or less than 4- and 5-digit numbers Finds differences in one-step situations and number representations **Released Example:** 44044	Compares differences in 4- and 5-digit numbers shown in various representations

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3.1.1.4 **Round numbers to the nearest 10,000, 1000, 100, and 10. Round up and round down to estimate sums and differences.**	Rounds numbers down to the nearest 10	Rounds 2-digit numbers to the nearest 10 and estimates their sum **Released Example:** 234155	Consistently rounds numbers with values up to 100,000 to the nearest 10, 100, and 1000 place Identifies a possible original number when given a rounded value Rounds numbers with values up to 100,000 to find sums and differences, including in real-world situations **Released Examples:** 43945, 234799	Rounds numbers with values up to 100,000 to find sums and differences in multi-step situations, including real-world situations Makes decisions about place-value rounding in mathematical situations **Released Examples:** 234695, 234721

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3.1.1.5 **Compare and order whole numbers up to 100,000.**	Compares and orders up to four 3-digit whole numbers Compares and orders 3- and 4-digit whole numbers using the hundreds or tens place, no more than one number with a 0 in the tens or hundreds place, and up to four numbers in the group **Released Examples:** 230020, 232145	Orders 4-digit numbers consistently with any place value when all digits are used Compares and orders 4- and 5-digit numbers using the thousands place value when all digits are used **Released Example:** 234098	Compares and orders whole numbers up to 100,000 using the place value of all digits in the number Finds missing digits when comparing and ordering 4- and 5-digit whole numbers **Released Example:** 234769	Consistently compares and orders whole numbers up to 100,000 with varying combinations and number of digits used in the group of numbers compared Finds missing digits in 5-digit whole numbers when ordering least to greatest

Add and subtract multi-digit whole numbers; represent multiplication and division in various ways; solve real-world and mathematical problems using arithmetic. (3.1.2)

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3.1.2.1 **Add and subtract multi-digit numbers using efficient and generalizable procedures based on knowledge of place value, including standard algorithms.**	Adds and subtracts 2- and/or 3-digit whole numbers when no or minimal regrouping skills are required **Released Examples:** 234723, 234698	Consistently regroups at least one time in order to subtract a 3-digit number Adds numbers according to place value **Released Examples:** 234700, 234746	Regroups to subtract 4-digit whole numbers Understands the terms sum and difference Adds three addends with 2-, 3-, and/or 4-digit whole numbers **Released Example:** 234207	Finds missing digits in number sentences involving addition or subtraction **Released Example:** 43944

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3.1.2.2 **Use addition and subtraction to solve real-world and mathematical problems involving whole numbers. Use various strategies, including the relationship between addition and subtraction, the use of technology and the context of the problem, to assess the reasonableness of results.**	Adds 3- and/or 4-digit whole numbers in context Subtracts 3-digit whole numbers when little to no regrouping is required **Released Examples:** 234162, 232096	Regroups to subtract 2- and/or 3-digit whole numbers to solve one-step real-world problems Adds and subtracts 2- and/or 3-digit whole numbers to solve two-step problems with little to no regrouping required **Released Examples:** 234764, 234777, 234725	Uses addition and subtraction to solve multi-step real-world problems involving whole numbers with up to 4 digits **Released Examples:** 235700, 235706	Explains steps and reasoning in multi-step real-world problems Compares and makes decisions based on properties of addition and subtraction to solve multi-step real-world problems

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3.1.2.3 **Represent multiplication facts using a variety of approaches, such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line, and skip counting. Represent division facts by using a variety of approaches, such as repeated subtraction, equal sharing and forming equal groups. Recognize the relationship between multiplication and division.**	Uses an array to represent a multiplication fact using 1-digit factors, where one of the factors is less than 5 Uses repeated subtraction to solve division problems **Released Example:** 230103	Uses equal-sized groups and arrays to solve multiplication facts Understands that multiplication and division are related **Released Example:** 235231	Represents multiplication and division with a variety of models Uses an array when solving multi-step word problems **Released Examples:** 232242, 234116, 235221	Fluently uses one or more number line representations of multiplication and division facts Solves problems using multiple multiplication facts to represent a product or value

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3.1.2.4 **Solve real-world and mathematical problems involving multiplication and division, including both "how many in each group" and "how many groups" division problems.**	Solves one-step multiplication problems with 1-digit factors, where one factor is less than 5 Uses models to solve one-step division problems with 1-digit factors, where one factor is less than 5	Consistently solves one-step multiplication problems in context Solves one-step division problems, where one factor is less than or equal to 5 **Released Examples:** 232160, 235217	Solves multi-step multiplication problems Solves one-step division problems **Released Example:** 235301	Solves multi-step division problems Finds multiple solutions to a problem, and identifies the best solution based on the context

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3.1.2.5 **Use strategies and algorithms based on knowledge of place value, equality and properties of addition and multiplication to multiply a two- or three-digit number by a one-digit number. Strategies may include mental strategies, partial products, the standard algorithm, and the commutative, associative and distributive properties.**	Identifies equality of one-step multiplication expressions using the commutative property	Solves multiplication problems involving a simple 2-digit factor **Released Example:** 235252	Identifies the result of finding the product of two numbers Solves multi-step multiplication problems Uses the commutative and distributive properties as well as partial products to identify equivalent expressions Uses basic descriptions to explain strategies **Released Examples:** 235249, 235250	Uses associative property and partial products to produce equivalent expressions, including numbers with the digit 0 in place values other than the ones Uses the term "product" and finds results Explains reasoning and strategies for finding or identifying equivalent expressions

Understand meanings and uses of fractions in real-world and mathematical situations. (3.1.3)

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3.1.3.1 **Read and write fractions with words and symbols. Recognize that fractions can be used to represent parts of a whole, parts of a set, points on a number line or distances on a number line.**	Identifies fractions in simple fraction bar models with denominators up to 6 **Released Examples:** 230043, 231024	Translates between symbol and word representations of fractions Matches a fraction model to a given fraction, and vice versa Has basic understanding of representing a fraction on a number line **Released Examples:** 234945, 234947	Understands that the denominator represents the whole Uses fraction representations for wholes as large as 8 Identifies fraction models that represent real-world situations and vice versa **Released Examples:** 233144, 234944, 235711	Fluently uses a number line to represent fractions Finds distances on a number line Determines the complements of fractions (i.e., the part that is NOT shown) **Released Example:** 234501

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3.1.3.2 **Understand that the size of a fractional part is relative to the size of the whole.**	Understands that when comparing the same fractional parts of different-sized wholes, only the size of the wholes needs to be compared **Released Example:** 730813	Distinguishes greatest or least fractional parts when given the same fraction for sets of different sizes Distinguishes greatest or least fractional parts when given different fractions for sets of the same size	Distinguishes greatest or least fractional parts, including when given different fractions for sets of different sizes **Released Example:** 236083	Compares and explains differences in amounts based on given or abstract values of a group **Released Example:** 235004
3.1.3.3 **Order and compare unit fractions and fractions with like denominators by using models and an understanding of the concept of numerator and denominator.**	Compares unit fraction models to identify the least fractional amount shaded	Orders 2- or 3-unit fractions with nonadjacent denominators Identifies the largest or smallest unit fraction	Uses models to order multiple fractions with like denominators and make comparisons Finds a fraction that is less than or greater than another given fraction **Released Examples:** 235507, 235509, 236011	Consistently orders fractions both with and without models Finds a fraction that satisfies at least two given comparison criteria **Released Examples:** 234120, 235224

Algebra

Use single-operation input-output rules to represent patterns and relationships and to solve real-world and mathematical problems. (3.2.1)

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3.2.1.1 **Create, describe and apply single-operation input-output rules involving addition, subtraction and multiplication to solve problems in various contexts.**	Identifies simple rules in patterns Finds the next number in simple patterns **Released Examples:** 231404, 232094	Identifies the next or second number out in patterns given in lists Creates and uses a one-step rule with addition or multiplication to identify a missing value in a list or in a table **Released Examples:** 232065, 234706	Finds missing numbers within lists and tables when there are gaps in both input and output values listed Creates and uses rules with addition, subtraction, or multiplication to find the second or third output past a given pattern Identifies rules and their descriptions in tables by analyzing the output based on the input within context **Released Examples:** 235240, 235258, 236013	Finds missing numbers within a list or input-output table containing up to 4-digit numbers in real-world contexts, including noting when the obvious input pattern is not followed Writes out rules in terms of their context **Released Examples:** 43597, 236050

Use number sentences involving multiplication and division basic facts and unknowns to represent and solve real-world and mathematical problems; create real-world situations corresponding to number sentences. (3.2.2)

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3.2.2.1 **Understand how to interpret number sentences involving multiplication and division basic facts and unknowns. Create real-world situations to represent number sentences.**	Identifies missing operations and solves number sentences with 1-digit factors **Released Examples:** 234747, 235273	Identifies missing operation symbols to make equivalent expressions Finds missing factor when one factor has 2 digits **Released Example:** 236117	Knows that equal-sized groups is a necessary condition for division contexts Uses fact family knowledge to find the missing piece of number sentences using two expressions Identifies possible contexts to describe multiplication number sentences using numbers up to 100 **Released Examples:** 234210, 234211	Identifies and creates possible contexts to describe multiplication and division number sentences Creates real-world situations to represent number sentences Identifies missing operation symbols to make a number sentence true with multiple missing symbols **Released Examples:** 234671, 235016, 235018

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3.2.2.2 **Use multiplication and division basic facts to represent a given problem situation using a number sentence. Use number sense and multiplication and division basic facts to find values for the unknowns that make the number sentences true.**	Uses basic multiplication facts to identify unknown values in given number sentences Uses basic division facts to identify the results in given number sentences **Released Examples:** 234089, 234691	Matches multiplication contexts that use traditional words (e.g., each) with the correct multiplication number sentences Uses multiplication facts to identify unknown values in given number sentences **Released Examples:** 236053, 234804	Identifies and creates multiplication or division number sentences that represent given situations Uses multiplication or division facts to find unknown values in given number sentences **Released Examples:** 236054, 232214	Identifies and creates number sentences with two operations to represent given situations Uses multiplication and division facts to find unknown values in unique and novel number sentences **Released Examples:** 235299, 730114

Geometry & Measurement

Use geometric attributes to describe and create shapes in various contexts. (3.3.1)

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3.3.1.1 **Identify parallel and perpendicular lines in various contexts, and use them to describe and create geometric shapes, such as right triangles, rectangles, parallelograms and trapezoids.**	Identifies 1 pair of parallel sides in rectangles **Released Examples:** 234051, 234674	Identifies 2 pairs of parallel sides in parallelograms Identifies a pair of parallel sides in trapezoids **Released Examples:** 234676, 234811	Identifies triangles and quadrilaterals based on the number of parallel and/or perpendicular sides Identifies parallel and perpendicular line segments in various contexts **Released Example:** 234814	Identifies geometric shapes based on the presence or lack of parallel and perpendicular sides Consistently identifies perpendicular lines in various contexts **Released Examples:** 234066, 234514

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3.3.1.2 **Sketch polygons with a given number of sides or vertices (corners), such as pentagons, hexagons and octagons.**	Identifies and uses the terms side, vertices, angle, triangle, square, and rectangle Identifies figures given the numbers of sides or vertices (less than 7) **Released Example:** 730542	Identifies and uses the terms hexagon and octagon Identifies multiple figures given the numbers of vertices **Released Examples:** 231097, 234770	Identifies and uses the terms rhombus, trapezoid, and pentagon Names polygons based on written descriptions Orders the names of shapes by the number of sides, angles, or vertices **Released Examples:** 231089, 234013	Completes figures to satisfy descriptions based on the number of sides and vertices Knows that polygons must be enclosed to be classified as polygons **Released Examples:** 232049, 232359

Understand perimeter as a measurable attribute of real-world and mathematical objects. Use various tools to measure distances. (3.3.2)

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3.3.2.1 **Use half units when measuring distances.**	Assessed within 3.3.2.2	Assessed within 3.3.2.2	Assessed within 3.3.2.2	Assessed within 3.3.2.2

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3.3.2.2 **Find the perimeter of a polygon by adding the lengths of the sides.**	Finds the perimeter of a given polygon where all side lengths are labeled with values up to 20 Finds the perimeter of a regular polygon with only one side length labeled with a value up to 10 **Released Examples:** 231460, 231463	Finds perimeters of regular polygons with written descriptions of side length Finds perimeters of rectangles with two sides clearly labeled **Released Examples:** 236130, 43750	Finds perimeters of polygons in context with written descriptions Compares perimeters of well-labeled polygons Finds the unknown side length of a polygon when given the other lengths and the perimeter Finds the unknown side lengths of regular polygons given the perimeter **Released Examples:** 231462, 233172, 43577	Uses the shapes of polygons to calculate unknown side lengths and perimeters Finds possible unknown side lengths for polygons Calculates perimeters of rectangles (perimeters larger than 100) based on only written descriptions of length and width **Released Examples:** 232236, 235722

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3.3.2.3 **Measure distances around objects.**	Identifies which tool is best for measuring the perimeter of one object **Released Examples:** 234786, 236098	Gives basic descriptions of how to measure perimeter of rectangles **Released Example:** 234151	Identifies a method and best tool(s) needed for measuring distance around any object Understands the uses and limits of different measuring tools	Gives complete and correct directions on various ways to measure the distance around objects **Released Example:** 235031

Use time, money and temperature to solve real-world and mathematical problems. (3.3.3)

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3.3.3.1 **Tell time to the minute using digital and analog clocks. Determine elapsed time to the minute.**	Reads the time on a digital clock Reads the time on an analog clock up to the first 30 minutes **Released Example:** 230235	Reads the time on an analog clock for all times Determines short, elapsed times that occur within the same hour **Released Examples:** 230231, 233086	Determines elapsed times that are more than 1 hour when times are given digitally **Released Examples:** 231116, 236064	Consistently determines elapsed times when times occur across hours (including from a.m. to p.m.) when times are given digitally Determines elapsed time when times are given with analog clocks Fluently represents amounts of time in minutes and in hours and minutes **Released Examples:** 231469, 234042

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3.3.3.2 **Know relationships among units of time.**	Knows that weeks are made up of days and that hours are made up of minutes	Converts from 1 to 3 hours into minutes Converts from days to weeks and days (less than 50 weeks) Converts larger time units into one unit smaller (e.g., years to months, weeks to days)	Converts between amounts of time expressed in mixed units into the smaller unit Converts smaller units into mixed-unit expressions of the same amount of time (e.g., minutes to hours and minutes)	Uses unit relationships when solving mathematical and real-world questions Orders amounts of time from least to greatest when time is expressed in mixed units **Released Examples:** 235282, 235284
3.3.3.3 **Make change up to one dollar in several different ways, including with as few coins as possible.**	Makes change with quarters **Released Example:** 231119	Finds the difference between the price of an item and next dollar amount (e.g., $3.55 and $4) **Released Example:** 231472	Identifies correct value and combinations of coins to give as change Identifies the fewest combination of coins to make a given amount of money **Released Examples:** 231474, 232093	Solves questions about the fewest number of coins that can be given as change Correctly adds or subtracts prices when determining how much change should be given **Released Examples:** 235517, 235702

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3.3.3.4 **Use an analog thermometer to determine temperature to the nearest degree in Fahrenheit and Celsius.**	Represents temperatures given on a thermometer that uses a scale of 1 or 5 degrees **Released Example:** 234141	Identifies which temperatures on thermometers are different than a given temperature	Applies an increase or decrease in temperature to find the new temperature with scale increments of 1, 2, or 5 degrees Finds the difference between two temperatures **Released Examples:** 235208, 232192	Finds the increase or decrease in temperatures given in any format Reads dual-labeled thermometers in Fahrenheit and Celsius **Released Examples:** 235200

Data Analysis

Collect, organize, display, and interpret data. Use labels and a variety of scales and units in displays. (3.4.1)

Benchmark	Does Not Meet *A typical student at this level of mathematics succeeds at few of the most fundamental mathematics skills of the Minnesota Academic Standards.* **Some of the skills typically demonstrated may include:**	Partially Meets *A typical student at this level of mathematics partially meets the mathematics skills of the Minnesota Academic Standards.* **Some of the skills typically demonstrated may include:**	Meets *A typical student at this level of mathematics meets the mathematics skills of the Minnesota Academic Standards.* **Some of the skills typically demonstrated may include:**	Exceeds *A typical student at this level of mathematics exceeds the mathematics skills of the Minnesota Academic Standards.* **Some of the skills typically demonstrated may include:**
3.4.1.1 **Collect, display and interpret data using frequency tables, bar graphs, picture graphs and number line plots having a variety of scales. Use appropriate titles, labels and units.**	Identifies information from tally charts, pictographs (up to 3 categories and key = 5), bar graphs (up to 5 bars and scales of 1, 2, and 5), and tables Displays a few data points in tally charts, pictographs (key = 5), bar graphs (up to 5 bars and scales of 1, 2, and 5), or tables **Released Examples:** 230017, 234516	Answers questions from pictographs (up to 4 categories and key 2–5) and simple line plots Answers one-step questions based on information given in pictographs (up to 4 categories and key 2–5), tables, and/or bar graphs (up to 4 bars and scales of 1, 2, and 5) Identifies good titles for graphs in context **Released Examples:** 236103, 23407402	Answers questions that require up to three steps to solve using information given and data displays Solves problems involving finding how many more or less using line plots Completes data displays in both their original format as well as a different data display Works with bar graphs and tables (including frequency tables) with data values up to 50 **Released Examples:** 233177, 730597, 231075, 234748, 235725	Finds missing data points when information is displayed in multiple ways Precisely describes data points and groups of points in context Analyzes and makes comparisons of data displayed in line plots Interprets the value of 0 from data displays in context Describes how changes in data, scales, or keys alters the data display **Released Examples:** 234783, 234794, 235041, 235047