

Provincial Assessment Results 2022-23: Grades 5 & 7 Mathematics

Background

Newly developed *Mathematics Assessments* were administered to students in grades 5 and 7 in the spring of 2023 to assess mathematical skills. Each assessment contained 28 items pertaining to topics in four strands (*Number, Patterns and Relations, Shape and Space, and Statistics and Probability*).

Since 2021-22, provincial assessments have been administered using an online platform. Students have unlimited access to an online assessment practice to familiarize themselves with the platform prior to the assessment period.

In 2021-22 a mode study was conducted to identify any impact or bias resulting from migration to the online platform. Traditional paper versions of the tests were administered to ten percent of students, while the rest completed the tests online. Results of statistical analyses indicated:

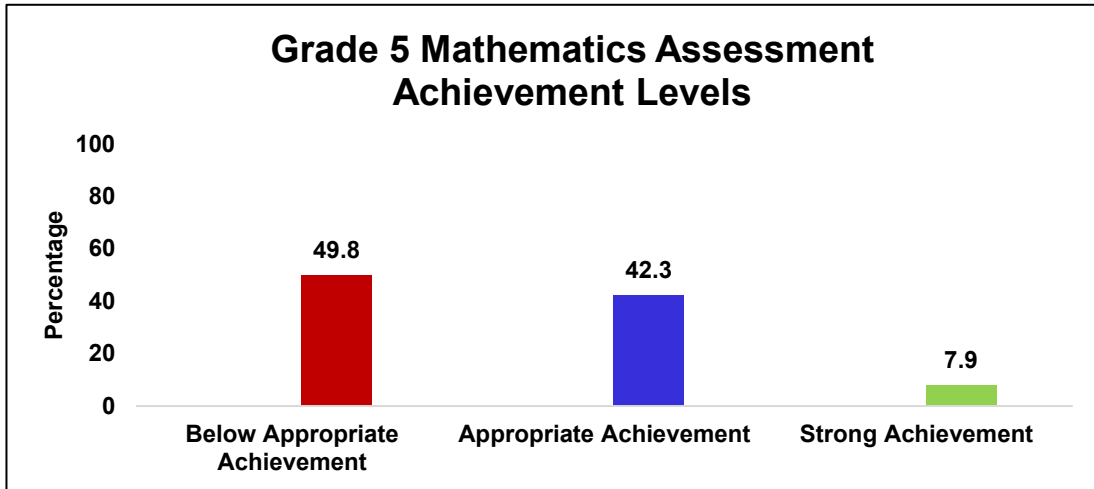
- Online versions were statistically equivalent to the paper versions.
- Test reliability was comparable to the previous year.
- Test items performed without bias for students in all programs of study and for students with accommodations.

In keeping with the Department's assessment protocols, test items were developed by groups of New Brunswick educators, including Grade 5 and Grade 7 classroom teachers and experienced subject area experts. The provincial field test took place in 2021-22.

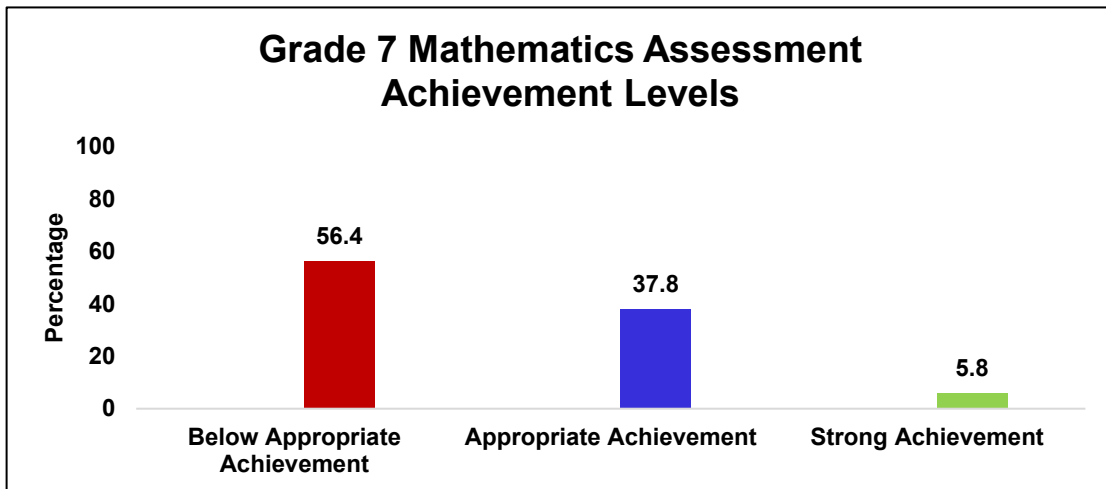
Warranted accommodations are provided to include as many students as possible in the provincial assessment program. Universal accommodations included coloured background, Dyslexie font, text-to-speech, text magnification, and toggling between English and French. In certain circumstances, it is necessary and fitting for students to be exempted from participation. This is the case when the testing format is not suitable for a student to demonstrate their learning, even with accommodations. For further information, please consult the [Provincial Assessment Program: Protocols for Accommodations and Exemptions](#).

Achievement Results

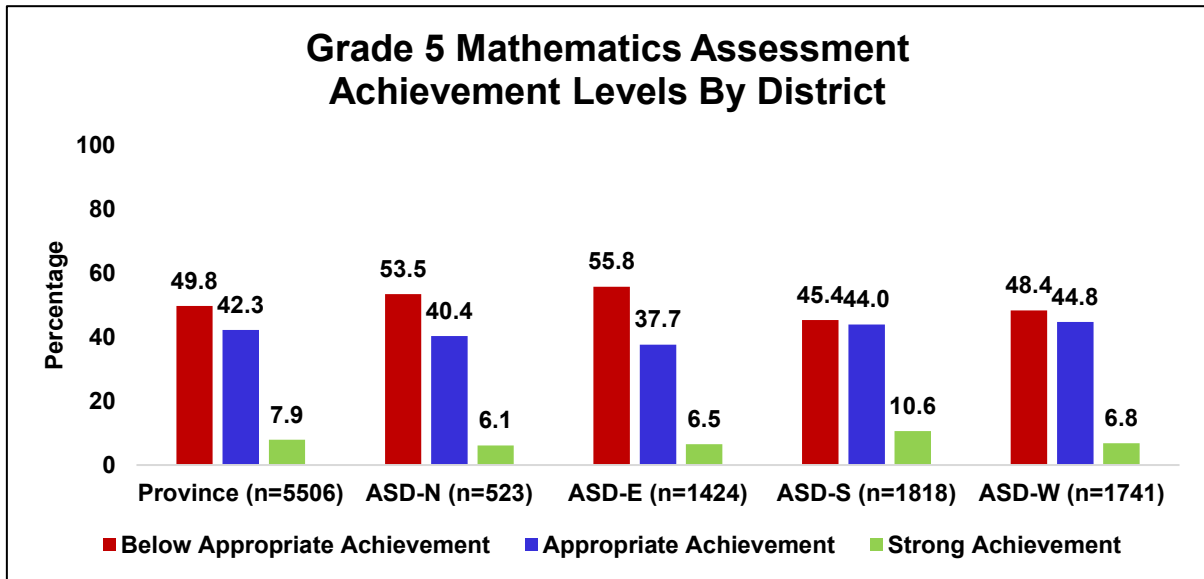
Of the 5622 Grade 5 students enrolled, 50.2% were successful (7.9% attained *Strong Achievement* and 42.3% attained *Appropriate Achievement*). The 49.8% of students in the *Below Appropriate Achievement* group includes exempted students (4.3%) but excludes students who are absent during the assessment administration period (2.1%).



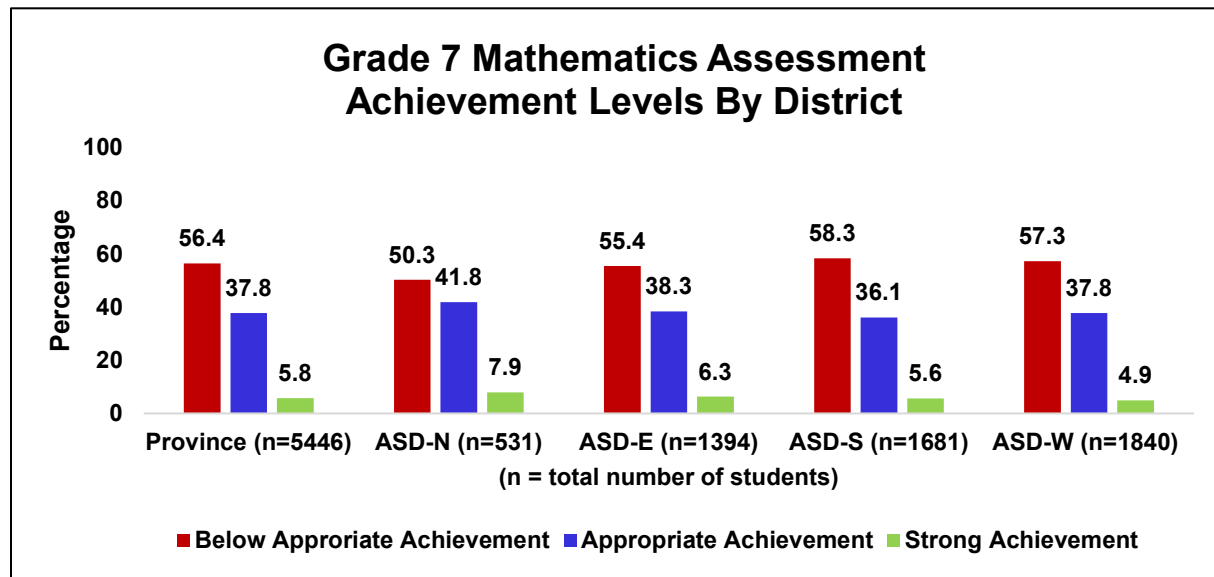
Of the 5732 Grade 7 students enrolled, 43.6% were successful (5.8% attained *Strong Achievement* and 37.8% attained *Appropriate Achievement*). The 56.4% of the students in the *Below Appropriate Achievement* group includes exempted students (3.5%) but excludes students who are absent during the assessment administration period (5.0%).



The graph below indicates the Grade 5 success rates for the province and for each school district. District success rates are as follows: ASD-N = 46.5%; ASD-E = 44.2%; ASD-S = 54.6%; ASD-W = 51.6%.



The graph below indicates the Grade 7 success rates for the province and for each school district. District success rates are as follows: ASD-N = 49.7%; ASD-E = 44.6%; ASD-S = 41.7%; ASD-W = 42.7%.



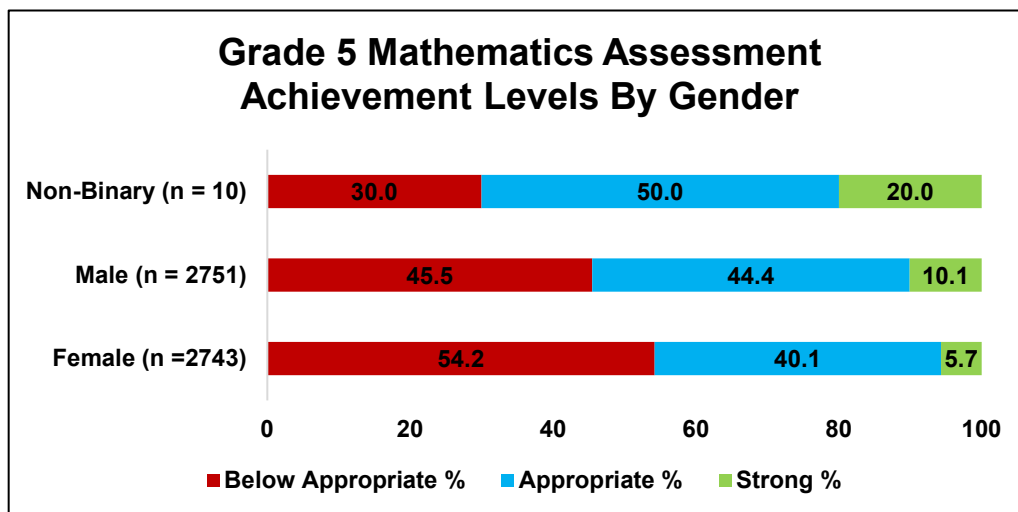
Exemption rates for the *Grade 5 Mathematics Assessment* are displayed in the table below.

Grade 5 Mathematics Assessment Exemption Rates				
District	Number of Grade 5 Students	Number of Students Exempt	Percent Exempt	Success Rate Excluding Exemptions
Province	5506	237	4.3	52.4%
ASD-North	523	11	2.1	47.5%
ASD-East	1424	72	5.1	46.5%
ASD-South	1818	85	4.7	57.2%
ASD West	1741	69	4.0	53.7%

Exemption rates for the *Grade 7 Mathematics Assessment* are displayed in the table below.

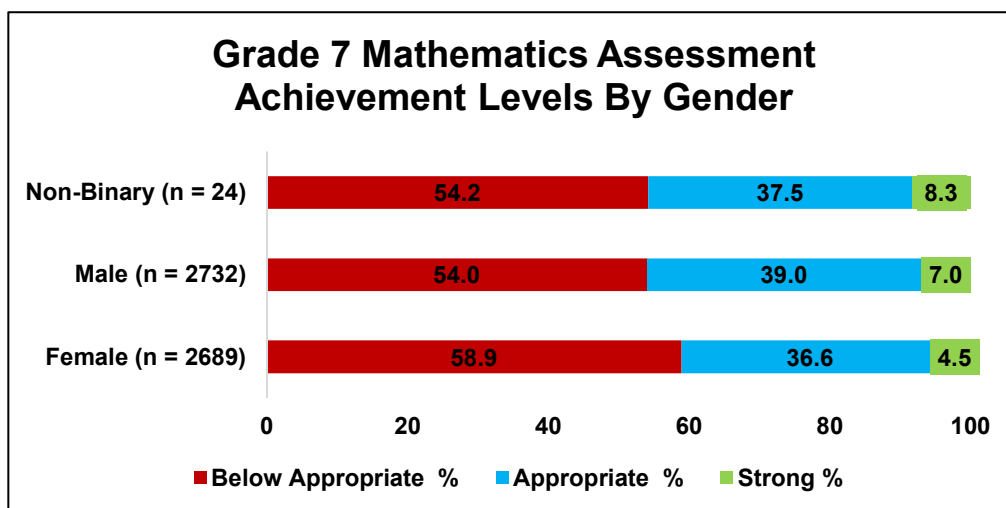
Grade 7 Mathematics Assessment Exemption Rates				
District	Number of Grade 7 Students	Number of Students Exempt	Percent Exempt	Success Rate Excluding Exemptions
Province	5446	191	3.5	45.2%
ASD-North	531	10	1.9	50.7%
ASD-East	1394	60	4.3	46.6%
ASD-South	1681	61	3.6	43.2%
ASD West	1840	60	3.3	44.2%

The following graph illustrates achievement levels by gender. Gender designations for this analysis were retrieved from administrative data contained in the provincial Student Information System. Combining *Appropriate* and *Strong* achievement levels, the Grade 5 success rate was 45.8% for female students, 54.5% for male, and 70.0% for non-binary students. Although there are few students in the latter group (10), results are included to provide a complete provincial picture and a baseline for anticipated increases in the number of students in this group over time.



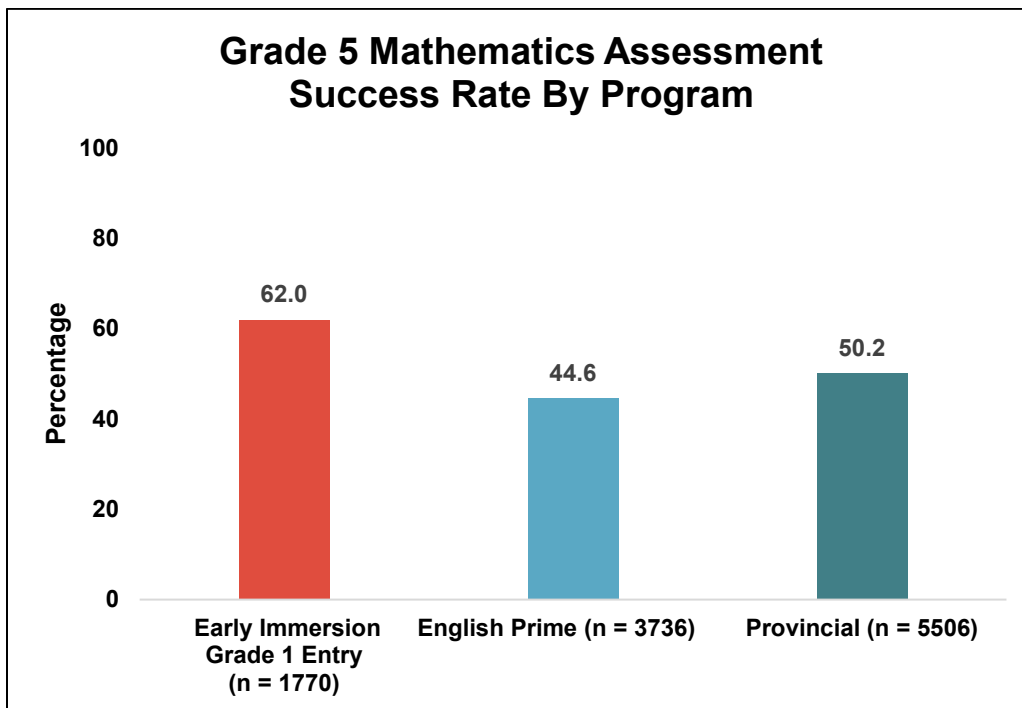
*Gender has 5504 total students because two students did not have gender assigned in PowerSchool.

Combining *Appropriate* and *Strong* achievement levels, the Grade 7 success rate was 41.1% for female students, 46.0% for male, and 45.8% for non-binary students. Although there are few students in the latter group (24), results are included to provide a complete provincial picture and a baseline for anticipated increases in the number of students in this group over time.

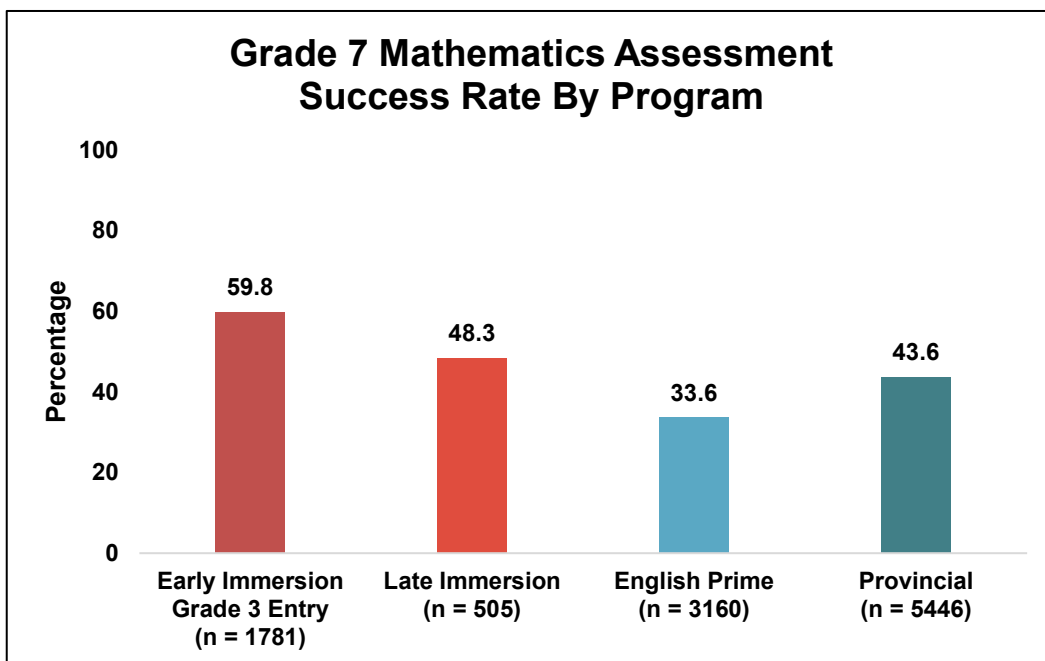


* Gender has 5445 total students because one student did not have gender assigned in PowerSchool.

The graph below indicates the Grade 5 student success rates by language program.

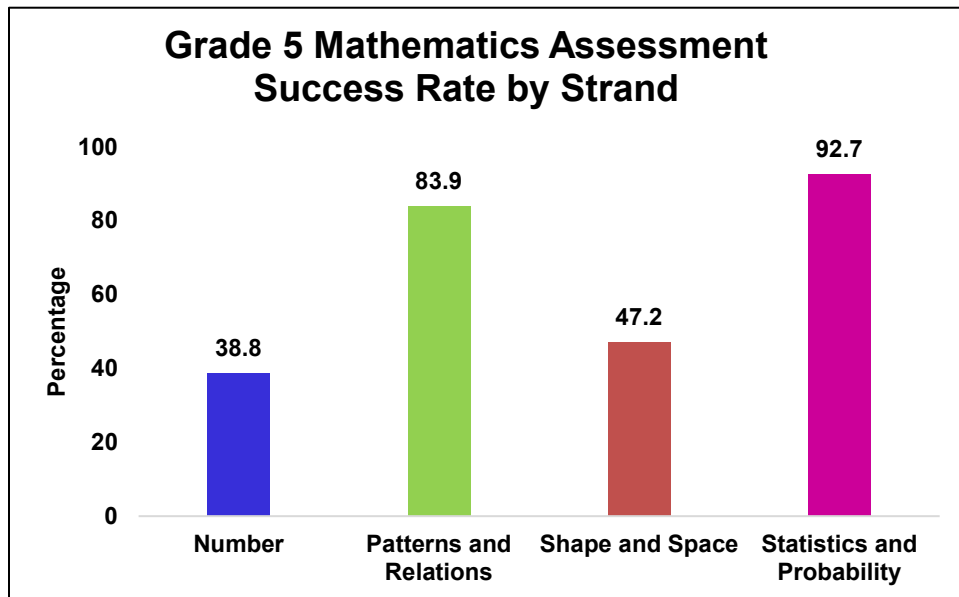


The graph below indicates the Grade 7 student success rates by language program.

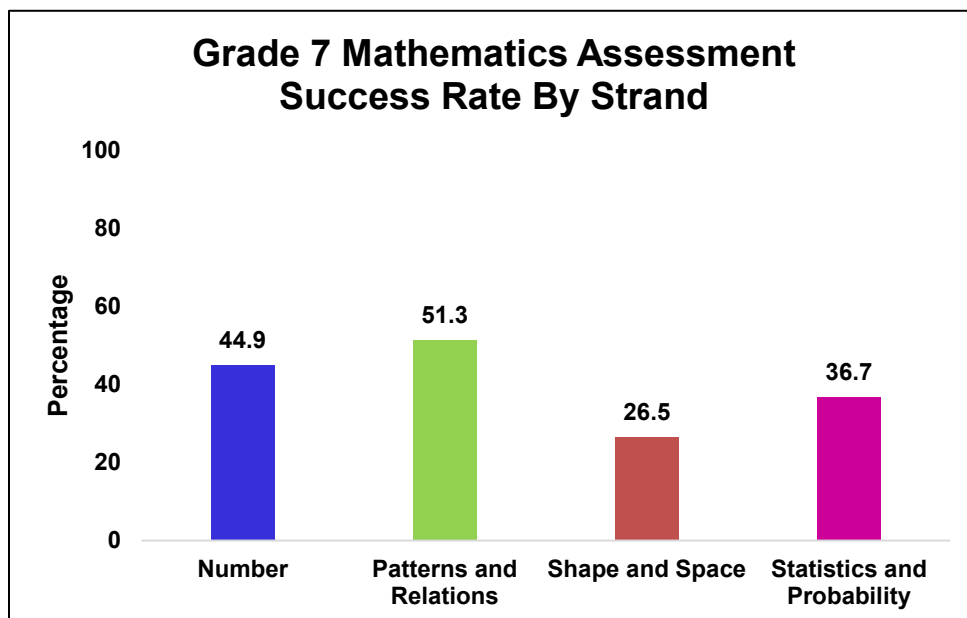


The assessment includes four curriculum strands: *Number*, *Patterns and Relations*, *Shape and Space*, and *Statistics and Probability*.

Overall, Grade 5 student success was highest for *Statistics and Probability* and *Patterns and Relations*.



Overall, Grade 7 student success was highest for *Patterns and Relations* and *Number*.



Description of the *Appropriate Achievement* Level for the Mathematics Priority Outcomes, End of Grade 5

Number Strand

- Represent and describe place value to 1 000 000.
- Use estimation strategies including front-end rounding, compensation, and compatible numbers, in problem-solving contexts.
- Apply mental mathematics strategies and number properties to determine answers for basic multiplication facts to 81 and related division facts.
- Apply mental mathematics strategies for multiplication (up to 2-digit by 2-digit), with and without concrete materials, such as: annexing then adding zero, halving and doubling, and using the distributive property.
- Demonstrate, with and without concrete materials, an understanding of division (3-digit by 1-digit) and interpret remainders to solve problems.
- Demonstrate an understanding of equivalent fractions with like and unlike denominators.
- Describe and represent decimals (tenths & hundredths) concretely, pictorially, and symbolically.
- Relate decimals to fractions (tenths & hundredths).
- Compare and order decimals (tenths & hundredths) by using: benchmarks, place value, and equivalent decimals.
- Demonstrate an understanding of addition and subtraction of decimals (tenths & hundredths).

Patterns and Relations

Variables and Equations

- Solve problems involving single-variable, one-step equations with whole number coefficients and whole number solutions.

Shape and Space

Measurement

- Demonstrate an understanding of measuring length (mm and km).
- Demonstrate an understanding of volume by selecting and justifying referents for cm^3 or m^3 units.
- Demonstrate an understanding of capacity by describing the relationship between mL and L.

Statistics and Probability

Data Analysis

- Construct and interpret bar graphs involving many to one correspondence to draw conclusions.

Description of the *Appropriate Achievement* Level for the Mathematics Priority Outcomes, End of Grade 7

Number Strand

- Demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected) to solve problems.
- Demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially, and symbolically (limited to positive sums and differences).
- Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically.

Patterns and Relations

Patterns

- Demonstrate an understanding of oral and written patterns and their equivalent linear relations.
- Create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems.

Variables and Equations

- Model and solve problems that can be represented by one-step linear equations of the form $x + a = b$, concretely, pictorially, and symbolically, where a and b are integers.
- Model and solve problems that can be represented by linear equations of the form: $ax + b = c$, $ax = b$, $x/a = b$, $a \neq 0$; concretely, pictorially, and symbolically, where a , b and c are whole numbers.

Shape and Space

Measurement

- Demonstrate an understanding of circles by: describing the relationships among radius, diameter, and circumference of circles, relating circumference to pi.
- Develop and apply a formula for determining the area of parallelograms, triangles, and circles.

Transformations

- Identify and plot points in the four quadrants of a Cartesian plane using integral ordered pairs.

Statistics and Probability

Data Analysis

- Demonstrate an understanding of central tendency and range by: determining the measures of central tendency (mean, median, mode) and range; determining the most appropriate measures of central tendency to report findings.

Probability

- Identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events.
- Determine the theoretical probability (determined using a tree diagram, table, or another graphic organizer).