

## Grade 7: A Comparison of WNCP Outcomes for 1995 and 2006

### WNCP (1995)

#### Strand: Number (Number Concepts)

*Students will:*

- use numbers to describe quantities
- represent numbers in multiple ways

#### General Outcome

Demonstrate a number sense for decimals and integers, including whole numbers.

#### Specific Outcomes

1. Define and use power, base and exponent to represent repeated multiplication. [C, T, V]
2. Write a whole number as:
  - An expanded numeral, using powers of 10
  - Scientific notation, and vice versa [C, CN, V]
3. Use divisibility rules to determine if a number is divisible by 2, 3, 4, 5, 6, 9, 10. [CN, R]
4. Read and write numbers to any number of decimal places. [C, CN, V]
5. Demonstrate and describe equivalent mixed numbers and improper fractions concretely, pictorially and symbolically. [C, R, V]
6. Compare and/or order improper fractions, mixed numbers and decimals to thousandths. [R, T, V]
7. Recognize and illustrate that all fractions and mixed numbers can be represented in decimal form (include terminating and repeating decimals). [R, V]

### WNCP (2006)

#### Strand: Number

**General Outcome:** *Develop number sense.*

#### Specific Outcomes

1. Determine and explain why a number is divisible by 2, 3, 4, 5, 6, 8, 9 or 10, and why a number cannot be divided by 0. [C, R]
2. Demonstrate and 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. [ME, PS, T] **Change to 1-digit divisors without the aid of technology in 2006.**
3. Solve problems involving percents from 1% to 100%. [C, CN, PS, R, T] **Some increase over 1995.**
4. Demonstrate an understanding of the relationship between positive repeating decimals and positive fractions, and positive terminating decimals and positive fractions. [C, CN, R, T]
5. 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). [C, CN, ME, PS, R, V]
6. Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially and symbolically. [C, CN, PS, R, V]

8. Convert from terminating decimals to fractions. [R]
9. Convert from single-digit repeater (0.3) decimal numbers to fractions, using patterns. [CN, R, V]
10. Demonstrate concretely and pictorially, that the sum of opposite integers is zero. [R, V]
11. Represent integers in a variety of concrete, pictorial and symbolic ways. [R, V]
12. Compare and order integers. [R, V]

7. Compare and order positive fractions, positive decimals (to thousandths) and whole numbers by using:
  - benchmarks
  - place value
  - equivalent fractions and/or decimals[CN, R, V]

## **Strand: Number Operations**

*Students will:*

- demonstrate an understanding of and proficiency with calculations.
- decide which arithmetic operation or operations can be used to solve problems and then solve the problem.

### **General Outcomes**

Apply arithmetic operations on decimals and integers, and illustrate their use in solving problems.

### **Specific Outcomes**

13. Use patterns, manipulatives and diagrams to demonstrate the concepts of multiplication and division by a decimal [CN, PS, R, V]
14. Use estimation strategies to justify or assess the reasonableness of calculations. [E, PS]
15. Add, subtract, multiply and divide decimals (for more than 2-digit divisors or multipliers, the use of technology is expected.) [E, PS, T] This was reduced to 1-digit divisors in 2006.
16. Add, subtract, multiply and divide integers concretely, pictorially and symbolically. [PS, V]
17. Illustrate and explain the order of operations, using paper and pencil or a calculator. [PS, T, V]

### **General Outcome**

Illustrate the use of rates, ratios, percentages and decimals in solving problems.

### **Specific Outcomes**

18. Estimate and calculate percentages. [E, PS]
19. Distinguish between rate and ratio, and use them to solve problems. [PS]
20. Explain, demonstrate and use proportion in solving problems. [C, PS, V]
21. Convert, mentally, among fractions, decimals and percents to facilitate the solution of problems. [E, PS]

## **Strand: Patterns and Relations (Patterns)**

*Students will:*

- use patterns to describe the world and to solve problems.

### **General Outcome**

Express patterns, including those used in business and industry, in terms of variables, and use expressions containing variables to make predictions.

### **Specific Outcomes**

1. Predict and justify possible  $n$ th values of a number pattern. [C, CN, R]
2. Interpolate and extrapolate number values from a given graph. [E, PS, V]
3. Graph relations, analyze the result and draw a conclusion from a pattern. [R, V]
4. Use patterns and relations to represent simple oral and written expressions as mathematical symbols, and vice versa. [CN, PS, R]

## **Strand: Patterns and Relations (Patterns)**

**General Outcome:** *Use patterns to describe the world and solve problems.*

### **Specific Outcomes**

1. Demonstrate an understanding or oral and written patterns and their equivalent **linear** relations. [C, CN, R]
2. Create a table of values from a **linear** relation, graph the table of values, and analyze the graph to draw conclusions and solve problems. [C, CN, R, V]

## Strand: Patterns and Relations (Variables and Equations)

*Students will:*

- represent algebraic expressions in multiple ways.

### General Outcome

Use variables and equations to express, summarize and apply relationships as problem-solving tools in a restricted range of contexts.

### Specific Outcomes

5. Write mathematical expressions that arise from problem-solving contexts. [C, CN, PS]
6. Evaluate expressions with and without concrete models. [R, V]
7. Illustrate the solution process for a one-step, single-variable, first-degree equation, using concrete materials or diagrams. [CN, PS, V]
8. Solve and verify one-step linear equations, using a variety of techniques. [PS, R]
9. Explain how to solve simple problems, using informal algebraic methods. [C, PS, R]

## Strand: Patterns and Relations (Variables and Equations)

**General Outcome:** *Represent algebraic expressions in multiple ways.*

### Specific Outcomes

3. Demonstrate an understanding of preservation of equality by:
  - modelling preservation of equality, concretely, pictorially and symbolically
  - applying preservation of equality to solve equations  
[C, CN, PS, R, V]
4. Explain the difference between an expression and an equation. [C, CN]
5. Evaluate an expression given the value of the variable(s). [CN, R]
6. 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. [CN, PS, R, V]
7. Model and solve problems that can be represented by linear equations of the form:
  - $ax + b = c$
  - $ax = c$
  - $x/a = b, a \neq 0$concretely, pictorially and symbolically, where  $a, b$  and  $c$  are whole numbers.  
[CN, PS, R, V]

**Strand: Shape and Space (Measurement)**

*Students will:*

- describe and compare everyday phenomena, using either direct or indirect measurement.

**General Outcome**

Solve problems involving the properties of circles and their connections with angles and time zones.

**Specific Outcomes**

1. Measure the diameters, radii and circumferences of circles, and establish the relationships among them. [CN, R]
2. Solve problems involving the radii, diameters and circumferences of circles. [PS, T]
3. Explain how time zones are determined. [C, PS]
4. Research and report how measurement instruments are used in the community. [C, CN]

**Strand: Shape and Space (Measurement)**

**General Outcome:** *Use direct or indirect measurement to solve problems.*

**Specific Outcomes**

1. Demonstrate an understanding of circles by:
  - describing the relationships among radius, diameter and circumference of circles
  - relating circumference to pi
  - determining the sum of the central angles
  - constructing circles with a given radius or diameter
  - solving problems involving the radii, diameters and circumferences of circles[C, CN, R, V]
2. Develop and apply a formula for determining the area of:
  - triangles
  - parallelograms
  - circles[CN, PS, R, V]

## Strand; Shape and Space (3-D objects and 2-D Shapes)

*Students will:*

- describe the characteristics of 3-D objects and 2-D shapes and analyze the relationships among them.

### General Outcome

Link angle measures to the properties of parallel lines.

### Specific Outcomes

5. Measure and classify pairs of angles as complementary or supplementary angles. [E]
6. Investigate, identify and name pairs of angles pertaining to parallel lines and transversals, including:
  - corresponding
  - vertically opposite
  - interior on the same side of the transversal
  - exterior on the same side of the transversal
  - alternate angles[C, V]
7. Describe the relationships between the pairs of angles pertaining to parallel lines and transversals. [C, R, T]
8. Explain in more than one way, why the sum of the measures of the angles of a triangle is  $180^\circ$ . [C, R, T]
9. Use mathematical reasoning to determine the measures of angles in a diagram. [R, V]
10. Construct angle bisectors and perpendicular bisectors. [R, T, V]

## Strand: Shape and Space (3-D Objects and 2-D Shapes)

**General Outcome:** *Describe the characteristics of 3-D objects and 2-D shapes and analyze the relationships among them.*

### Specific Outcomes

3. Perform geometric constructions, including
  - perpendicular line segments
  - parallel line segments
  - perpendicular bisectors
  - angle bisectors[CN, R, V]

**Strand: Shape and Space  
(Transformations)**

*Students will:*

- perform, analyze and create transformations.

**General Outcome**

Create and analyze patterns and designs, using congruence, symmetry, translation, rotation and reflection.

**Specific Outcome**

11. Create, analyze and describe designs, using translations (slides), rotations (turns) and reflections (flips). [C, T, V]
12. Use informal concepts of congruence to describe images after translations, rotations and reflections. [C, T]
13. Draw designs, using ordered pairs, in all four quadrants of the coordinate grid, together with translation and reflection images. [PS, V]
14. Relate reflections to lines and planes of symmetry. [CN, V]

**Strand: Shape and Space  
(Transformations)**

**General Outcome:** *Describe and analyze position and motion of objects and shapes.*

**Specific Outcomes**

4. Identify and plot points in the four quadrants of a Cartesian plane using integral ordered pairs. [C, CN, V]
5. Perform and describe transformations (translations, **rotations** or reflections) of a 2-D shape in all four quadrants of a Cartesian plane (limited to integral number vertices). [C, CN, PS, T, V]  
**Rotations are new in the 2006 document.**

## Strand: Statistics and Probability (Data Analysis)

*Students will:*

- collect, display and analyze data to make predictions about a population.

### General Outcome

Develop and implement a plan for the collection, display and analysis of data, using measures of variability and central tendency.

### Specific Outcomes

1. Formulate questions for investigation, from a real-world context. [C, CN, R]
2. Select, defend and use appropriate methods of collecting data:
  - designing and using questionnaires
  - interviews
  - experiments
  - research [C, PS, T]
3. Describe issues to be considered when collecting data; e.g., appropriate language, ethics, cost, privacy, cultural sensitivity. [C, CN, R]
4. Display data by hand or by computer in a variety of ways, including circle graphs. [C, T, V]
5. Read and interpret graphs. [C, E, PS, R]
6. Determine measures of central tendency for a set of data:
  - mode
  - median
  - mean [PS]
7. Determine measures of the distribution of a set of data:
  - range
  - extremes, gaps and clusters
  - quartiles [PS]
8. Interpolate from data to make predictions. [E, PS, R]

## Strand: Statistics and Probability (Data Analysis)

**General Outcome:** *Collect, display and analyze data to solve problems.*

### Specific Outcomes

1. 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 [C, PS, R, T]
2. Determine the effect on the mean, median and mode when an outlier is included in a data set. [C, CN, PS, R]
3. Construct, label and interpret circle graphs to solve problems. [C, CN, PS, R, T, V]

**Strand: Statistics and Probability  
(Chance and Uncertainty)**

*Students will:*

- use experimental or theoretical probability to represent and solve problems involving uncertainty.

**General Outcome**

Create and solve problems, using probability.

**Specific Outcomes**

9. Use a table to identify all possible outcomes of two independent events. [PS, R]
10. Create and solve problems, using the numerical definition of probability as favourable outcomes divided by possible outcomes. [PS, R]
11. Use the Monte Carlo simulation method to solve probability problems. [CN, E, PS, T]

**Strand: Statistics and Probability  
(Chance and Uncertainty)**

**General Outcome:** *Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.*

**Specific Outcomes**

4. Express probabilities as ratios, fractions and percents. [C, CN, R, T, V]
5. Identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events. [C, ME, PS]
6. Conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table or another graphic organizer) and experimental probability of two independent events. [C, PS, R, T]