

Publisher Questions to Western and Northern Canadian Protocol (WNCP) Mathematics Team

Grade 7

- 1. Students will use concrete materials and diagrams to add and subtract integers. Should they be able to add and subtract integers without models as well by the end of the unit?**

WNCP Response: Yes, but it is important that students work at the concrete and pictorial level first in developing their understanding of adding and subtracting integers.

- 2. Is it acceptable to support the addition and subtraction of integers using calculators after the ideas have been developed with manipulatives and diagrams?**

WNCP Response: No, the numbers should be chosen for ease of calculation so as not to require calculators as technology has not been identified as a process for this outcome. That is, students are expected to add and subtract integers without using calculators.

- 3. Is it expected that all addition and subtraction of integer outcomes would be completed in grade 7?**

WNCP Response: Yes, this topic will not occur in other grades.

- 4. We intend to provide all answers to teachers in the grade 4 and grade 7 teacher's guides. Is it acceptable to provide some answers in the back of the grade 7 student text, or is it expected that all answers be provided. Is it acceptable to provide some answers in the back of the grade 4 student text?**

WNCP Response: The call for resources stipulates that all answers to exercises need to be provided. It is a publisher's discretion as to where to provide them. This is a marketing issue for the most part. We prefer that all answers appear in the student textbooks. When open-ended questions are given, provide one or two possible responses rather than "Answers will vary."

Grade 3

- 5. Shape and Space specific outcome 7 refers to sorting and naming regular and irregular polygons according to the number of sides including triangles, quadrilaterals, pentagons, hexagons, and octagons. Would you like students to name types of quadrilaterals, e.g., square, rectangle, rhombus, trapezoid? Or would this level of naming be left until Grade 5?**

WNCP Response: No, students name types of quadrilaterals in Grade 5 and types of triangles in Grade 6. The outcome and indicators state the intent is to sort by number of sides alone. Students should distinguish between regular and irregular polygons.

Grade 4

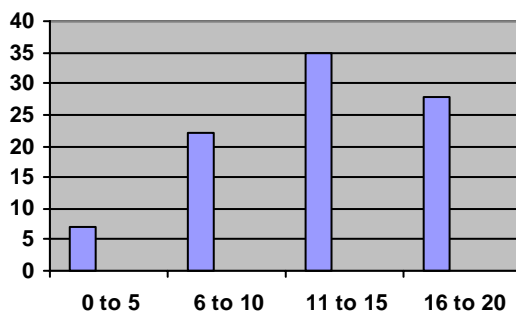
- 6. In the operations outcomes, students are to use “personal strategies.” At other grades, the term “personal procedures” is sometimes used for operations. Is there a distinction?**

WNCP Response: We have addressed this in our revisions and now refer to personal strategies throughout the document.

- 7. Statistics and Probability outcome 2 refers to constructing and interpreting pictographs and bar graphs involving many-to-one correspondence.**
a) Should we introduce partial icons (i.e., halves or fourths) in the pictographs or whole icons only?

WNCP Response: Partial icons are okay as long as the interpretation is easy to accomplish; e.g., halves are fine, $3/17^{\text{th}}$'s is not. These are Grade 4 students and they should be able to tell what half of a thousand is, but beyond that whole icons would be preferable as operations on fractions do not occur for another four years.

- b) Would this include a bar graph with intervals (many-to-one correspondence) on the X-axis as shown below, or just categories on the X-axis?**



WNCP Response: The intervals would occur on the Y-axis.

- c) In the first achievement indicator, “Identify the appropriate interval and correspondence for displaying a given set of data in a graph and justify the choice,” does “interval” refer to the vertical scale on a bar graph? If so, which term would you like Gr.4 students to use, interval or scale?**

WNCP Response: The term scale should be used.

- d) The second achievement indicator says “Create and label (with axes, title, and legend) a pictograph ...” What is meant by axes on a pictograph?**

WNCP Response: We were referring to the categories. This will be changed in the achievement indicator to make it more clear.

- e) **Achievement indicator 3 refers to the axes, title and legend on a bar graph. What is meant by “legend” in this context, when students are not yet graphing more than one variable?**

WNCP Response: We will delete the term legend in this achievement indicator.

Publisher Questions to Western and Northern Canadian Protocol (WNCP) Mathematics Team

K-1

- 1. In Grade 1 Measurement, specific outcome #1 includes the process ME. According to the description of the process in the background information, ME is about calculating mentally and involves number sense. How is mental mathematics possible when the students are not to use non-standard units? Or, does the mental mathematics here refer to making predictions?**

WNCP Response: The process of ME has been removed from the outcome. However, it is important to note that ME as a process includes estimation which is used in the measurement and comparison of objects. The process was removed because this outcome deals with direct comparison only.

- 2. The topic of money is not included in the Specific Outcomes, however it does appear in the indicators. Is it correct to assume that the introduction of the \$ symbol should not occur before Grade 4?**

WNCP Response: The concept of money can be used as context for number operations. Students will see & signs before Grade 4 so they may come up when the context is appropriate. The symbol \$ may appear earlier than Grade 4 if a student is asked to add \$4 and \$5 or how many pennies is \$1 but students would not be asked to add money such as $\$4.35 + \2.50 before Grade 4.

- 3. We recognize that visualization is about mental imagery, but we also recognize that the focus in Kindergarten and even Grade 1 is on concrete manipulation. When the WNCP uses the V process code in these early grades, is the intent a deliberate focus on having the students use and talk about mental images or is it simply setting the groundwork by providing experiences with concrete materials that they can later refer to mentally?**

WNCP Response: Please refer to page 9 or the March 3, 2006 draft. Where it states, "Visualization is fostered through the use of concrete materials, technology and a variety of visual representations." The intent is to provide experiences with concrete materials.

Grade 4

- 4. In number outcomes 1 (represent and describe whole numbers to 10 000) and 2 (compare and order numbers to 10 000), does "to 10 000" mean "including 10 000" or does it mean 4-digit numbers only?**

WNCP Response: It means including 10 000.

5. What is the difference between the following outcomes from the patterns and relations strand: Gr.3 outcome 4 and Gr.4 outcome 6?

Gr.3

4. *Solve one-step equations involving symbols representing an unknown number.*
[C, CN, PS, R, V]

Achievement indicators:

- *Explain the purpose of the symbol in a given equation with one unknown.*
- *Create an equation with one unknown to represent a given situation.*
- *Create an alternative symbol for the unknown in a given equation.*
- *Explain why two equations in which the unknown is represented by different symbols can be the same.*
- *Solve a given equation with one unknown using manipulatives.*
- *Solve a given equation with one unknown using guess and test.*

Gr.4

6. *Solve one-step equations involving a symbol to represent an unknown number.*
[C, CN, PS, R, V]

Achievement indicators:

- *Solve a given one-step equation using manipulatives.*
- *Solve a given one-step equation using guess and test.*
- *Describe orally the meaning of a given one-step equation with one unknown.*
- *Solve a given equation when the unknown is on the left or right side of the equation.*

WNCP Response: Please refer to the March 3, 2006 draft. These outcomes have been changed to address your concern.

Grade 7

6. Number outcome 2 states “for more than 1-digit divisors or multipliers, the use of technology is expected.” The fourth indicator for that outcome says that multipliers and divisors can be decimals. Does this mean that the following is the complete set of divisors and multipliers (without the use of technology) for Gr. 7: 9, 8, 7, 6, 5, 4, 3, 2, 1, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9?

WNCP Response: For this purpose, 0.3 is considered a 1-digit divisor or multiplier and 1.3 is considered a 2-digit divisor or multiplier.

Publisher Questions to Western and Northern Canadian Protocol (WNCP) Mathematics Team

- 1. In grade 4 N 3 (outcomes dealing with addition and subtraction): no mention is made of concrete materials. Is this intentional? Is it assumed that students will not need to use any concrete materials by grade 4? You mention using concrete materials in Grade 3 for adding and subtracting and also in Grade 4 for multiplication and division but there is no mention of concrete materials for adding and subtracting in grade 4.**

WNCP Response: Concrete materials can certainly be used to develop understanding of addition and subtraction and the modeling of addition and subtraction using concrete materials is encouraged.

- 2. Grade 4 N 5 (multiplication facts to 9×9): Should this include the corresponding division facts similar to how we worded the addition and subtraction facts in Grade 3? (Grade 3 N-10 – Apply mental mathematics strategies and number properties to determine answers for basic addition facts and related subtraction facts (to18)).**

WNCP Response: The outcome will read “*Communicate and apply mental mathematics strategies to determine basic multiplication facts and related division facts (to 9×9)*”.

- 3. Grade 3 N-11: Demonstrate an understanding of multiplication to 5×5 by:**
 - Relating multiplication to repeated addition
 - Relating multiplication to division ????? Should we add this?

WNCP Response: Yes, relating multiplication to division will be added.

- 4. Grade 3 N-11: Demonstrate an understanding of division to 5×5 by:**
 - Relating division to repeated subtraction
 - Relating division to multiplication????? Should we add this?

WNCP Response: Yes, relating division to multiplication will be added.

- 5. The kilometer is not mentioned in the K- 7 curriculum. In previous publisher exchanges with the WNCP math team, we heard that the kilometer would be in the grade 8 mathematics program, but that it is covered in the Science curriculum at earlier grades. Does this mean that we can use the kilometer in contextual problems to support the development of larger number concepts in grade 4 (rather than measurement concepts), without it being deemed extraneous content?**

WNCP Response: Contextual problems that involve the term kilometer but do not require the student to convert between units would be acceptable at the grade 4 level.

- 6. Can things like a calendar be used to represent numbers? Is everyday use of the calendar and hundreds chart appropriate in the kindergarten classroom, even though the numbers are beyond those discussed in the curriculum, or must this be saved for introduction in grade 1?**

WNCP Response: It is important for students in Kindergarten to be exposed to things that are relevant to them and that help them develop their understanding of numbers to 10. Many experiences that involve numbers up to and including 10 should appear in the resource.

The calendar could be used as a tool for developing number sense but students should be assessed only on the learning outcomes. Students in kindergarten may be exposed to numbers greater than 10 but they should not be assessed on their understanding of numbers greater than 10.

Publisher Questions to Western and Northern Canadian Protocol (WNCP) Mathematics Team

Grade 1

1. With the recent removal of outcome N5 (Read and write a numeral, 0 to 100) from the current publisher's draft (March 3, 2006), what is expected of Grade 1 students for numbers beyond 20 (to 100)? Is it acceptable for published resources to show printed numerals between 20 and 100, provided there is no emphasis on the mechanics of printing numerals?

WNCP Response: The following indicators have been added to N-5:

- Record a given numeral (to 100) symbolically when it is presented orally.
- Read a given numeral (to 100) when it is presented symbolically.

2. Why was "to 20" removed from outcome N1, when all the achievement indicators for that outcome look at number to 20 only? Is it now acceptable to go beyond 20?

WNCP Response: The outcome now reads, "Represent and describe numbers to 20, concretely, pictorially and symbolically".

Grade 4

3. New Outcome N11 requires students to add and subtract decimals (limited to hundredths). While we can appreciate that there may be benefits to allowing operations with decimals prior to Grade 6 (per June draft), we are alarmed at the stage at which this curriculum change has been introduced in the curriculum development process, since manuscript development is well underway, and this change will require several new lessons to be inserted into existing materials already under editorial review. If at all possible to allow Grade 5 to carry this earlier start to decimal operations, it would significantly help to support publishers' needs in meeting an ambitious submission schedule.

WNCP Response: This outcome will remain in grade 4.

Grade 7

4. In Number outcome 4, Achievement Indicator 1, the fraction $\frac{1}{11}$ is represented by the repeating decimal $0.09\overline{09}$ and the fraction $\frac{2}{11}$ is represented by the repeating decimal $0.18\overline{18}$. The repeating decimals should be written as $0.\overline{09}$ and $0.\overline{18}$.

WNCP Response: This has been corrected.

- 5. Number Outcome 2, now reads: Demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals (for more than 1-digit divisors or multipliers, the use of technology is expected) to solve problems. Please consider the following:**
- a. In Grade 5, students multiply 2-digit by 2-digit whole numbers. (They never seem to divide by more than 1-digit whole numbers.)**
 - b. In Grade 7 we can only use multipliers between 0.1 and 0.9 without the use of technology.**

When students multiply as they would whole numbers, and use front-end estimation to place the decimal, it is like multiplying by a 1-digit whole number. The AI which shows the use of front-end estimation to place the decimal has this example:

$\$12.33 \times 2.4$, think $\$12 \times 2$.

This would now be done with technology, and the estimate would only be used to check the reasonableness of the solution.

This seems to suggest that 2.1×2.5 must be done with a calculator, or the material is deemed extraneous. Is it extraneous to have students calculate 2.1×2.5 using any method other than with technology?

WNCP Response: The wording has been changed to clarify that 2-digit multiplication is acceptable without the use of technology. E.g., 1.2×3.4 Division is limited to 1-digit divisors.

- 6. Two new outcomes have been added to Grade 7, both of which will require significant new development work while we are in the midst of manuscript development.**
- N 7 requires students to compare and order fractions, decimals, and integers by using several methods. This will likely add lessons to the appropriate units. If this material is, or can be, covered in Grade 6 where it could logically fall into the flow of development, then this would both suit the needs of a sound curriculum and avoid risking editorial schedules.**
 - Outcome PR 3 requires students to demonstrate and explain the meaning of equality concretely, pictorially and symbolically. This will add lessons to material already in development.**

WNCP Response: These outcomes will remain at the grade levels indicated in the March 3, 2006 draft.

- 7. An achievement indicator for SS (Transformations) has been added that requires students to use a new notation. Not only will this additional AI add one or, potentially, several lessons, it could also be considered rather early for**

students to be working with mapping notation, which is not a simple way to represent transformations.

WNCP Response: Mapping notation has been removed.

Follow-up to Publishers' Questions and Answers Already Posted

Overall

We asked whether it was acceptable to include contextual problems in which kilometers were referenced as part of the overall context. The WNCP response seemed ambiguous: did it mean that a reference to kilometers cannot occur anywhere in the Student Book?

For example, would a problem such as one of the following be deemed inappropriate?

- Mount Everest is 8.850 km high.
Mount Logan is 5.959 km high.
What is the difference in their heights?
- The Singh family traveled 550 km on Saturday.
They traveled 395 km on Sunday.
How far did they travel on the two days?

WNCP Response: The use of km in a contextual problem where no conversion between units is required is acceptable.

Grade 1

We learned in the January 31, 2006 Publisher Questions and responses that students should only start to use non-standard units to measure objects in Grade 2. This raises questions for the Grade 1 outcomes related to area and capacity and mass. How are Grade 1 students expected to “compare by filling or covering” if they are not using any type of units, including non-standard units? For example, to determine which of two or more given objects has the greatest/least area by covering, doesn't the material used to cover the object (e.g., paper, cubes, a book) become a non-standard unit? So, if the two given objects are say a keyboard and a desk, and students use a piece of paper to determine which has the greater area, isn't the piece of paper a non-standard unit? And because students are expected to explain their reasoning, it would not be enough for them to simply say "the desk." The same reasoning would apply to comparing by filling.

WNCP Response: The focus in grade one is the process of comparing in order to “measure”. The term unit is not addressed until grade 2. However, students may use non-standard units to assist them with their comparisons. E.g., the students may say it takes more sheets of paper to cover the desk than the keyboard. Students will not be expected to identify the “unit” used to make the comparison.

Grade 4

Shape and Space Outcome 4 indicates that students are to describe, name and construct 3-D objects including

- **rectangular prisms**
- **triangular prisms.**

All of the AI's refer to rectangular and triangular prisms only. However, if students work exclusively with such prisms, then they miss the opportunity to distinguish their attributes by observing “what is NOT a prism,” for example, pyramids or cylinders. We would hope that resources are able to include non-examples in activities in order that students can engage in richer, deeper activities and so that they better understand what distinguishes a prism from other objects – some of which have been introduced in earlier grades.

WNCP Response: The use of non-examples is acceptable as long as the student is not expected to name and describe the non-examples. The goal is to focus on the attributes of rectangular prisms and triangular prisms, not on the attributes of cylinders and pyramids.