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

Grade 3

1. **When students measure the mass of everyday objects that are between whole number kilograms, should they express that mass in kg and g? For example, would they use a pan balance and metric weights to measure and record the mass using both units, such as 5 kg 200 g? Or should students say the object's mass is between 5 kg and 6 kg, or about 5 kg?**

SS4. *Demonstrate an understanding of measuring mass (g, kg) by:*

- *selecting and justifying referents for the units g and kg*
- *modelling and describing the relationship between the units g and kg*
- *estimating mass using referents*
- *measuring and recording mass.*

Achievement Indicator

7. Measure, using a scale, and record the mass of given everyday objects using the units g and kg.

WNCP Response: They should express the mass in kg and g. The mass should not be expressed using decimals such as 4.5 kg.

2. **For Achievement Indicator 3, do all types of 3-D objects need to be included (including spheres, cones, and cylinders)?**

SS6. *Describe 3-D objects according to the shape of the faces, and the number of edges and vertices.*

Achievement Indicators

1. Identify the faces, edges and vertices of given 3-D objects, including cubes, spheres, cones, cylinders, pyramids and prisms.
2. Identify the shape of the faces of a given 3-D object.
3. Determine the number of faces, edges and vertices of a given 3-D object.

WNCP Response: Yes, all types of 3-D objects should be included.

3. **Please confirm whether or not the following definitions coincide with the WNCP definitions of these terms.**
   - **A face is a flat surface of a solid. (Therefore a cylinder has 2 faces, a cone has 1 face, and a sphere has 0 faces.)**

WNCP Response: Yes

- **An edge occurs where two surfaces meet. (Therefore a cylinder has 2 edges, where each flat surface meets the curved surface. A cone has 1 edge, and a sphere has 0 edges.)**

WNCP Response: Yes

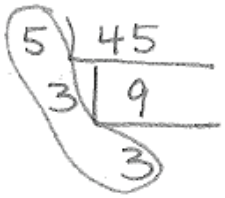
- **A vertex is the point at the corner of a shape or object where sides or edges meet. (Therefore, a cylinder, a cone, and a sphere each has 0 vertices – the point on a cone is the apex.)**

WNCP Response: The vertex is a common endpoint of two sides of a polygon, or three edges of a three-dimensional object. The apex of a figure is a point on the figure furthest from a base in the figure.

Grade 6

N3-3. Identify the factors for a given number and explain the strategy used, e.g., concrete or visual representations, repeated division by prime numbers or factor trees.

1. **We are unclear about the example that includes using repeated division by prime numbers. If you divide a composite number repeatedly by primes, you get only primes, which is the process of prime factorization. For example,**



In an earlier response to a question, you indicated that prime factorization was not part of the Gr.6 curriculum. Also if you divide by prime numbers only, you cannot necessarily identify all factors of a given number. In the example shown, 15 is a factor of 45. It can be derived but it is not necessarily listed by dividing only by primes.

- **Should Gr.6 resources include repeated division by primes? And if so, should it be used to identify all factors of a number, some factors of a number, or just prime factors?**

WNCP Response: Repeated division by primes should not be used as the only way to look at finding the factors of a number. Students can use division by a prime as a method of finding the factors and can identify the factors that are prime without having to go the whole way into prime factorization. For example, with 45, students can say that 5 and 3 are factors of 45 without having to go the extra step of saying the prime factorization of 45 is 3x3x5 as this goes beyond the expectations of this outcome. If this method is included it is important that the resource, especially the teacher guide, clearly states that prime factorization is not an outcome in grade 6.

- **Alternatively, should Gr.6 resources include repeated division by whole numbers rather than primes? For example, to identify the factors of 12: 12 ÷ 1 = 12; 12 ÷ 2 = 6; 12 ÷ 3 = 4; the factors of 12 are 1, 2, 3, 4, 6 and 12**

WNCP Response: Using the "rainbow" method of finding factors and of determining whether you have found all of the factors of a given number is an excellent strategy and should appear in the resource. This strategy leads students to understand that factors are numbers that divide evenly into the given number.

- **Likewise, should a factor tree be used to identify all factors or to identify only some factors or some factor pairs? In a typical factor tree, a number is divided by factors until only prime factors remain at the ends of the branches of the tree (i.e., prime factorization). As with repeated division, not all the factors of a given number will be identified.**

WNCP Response: Factor trees are another good method of looking at factors but students should not be expected to continue the factor tree until all the numbers are prime. For example, when factoring 72, if a student stops at 2x6x6 with a factor tree, that would be fine as long as the question is asking for some of the factors of 72 or asking whether 6 is a factor.

Please note that the indicator has provided methods as examples. They are neither the only way to find factors or a list of necessary methods. Multiple methods are preferred with some discussion of which method works for particular situations or for particular students. The outcome is about understanding factors.

2. **Is it acceptable to use the term "prime factors" instead of the longer term "factors that are prime?"**

WNCP Response: Prime factors as a term is related to prime factorization – writing a number as a unique set of primes. This is beyond the outcome for the course and should only be used in the teacher's guide as a note to teachers about related topics in Number Theory. "Factors that are prime" is preferred.