GRADE 6 : PATTERNS AND RELATIONS

3. Represent generalizations arising from number relationships, using equations with letter variables.
   - Develop and justify equations using letter variables that illustrate the commutative property of addition and multiplication; e.g., a + b = b + a or a × b = b × a.
5. Demonstrate and explain the meaning of preservation of equality, concretely and pictorially.

+Resources

Note for teachers: Reference - K-6 Generalizations - Click here

Number Property	Generalized Expression
Addition and subtraction are inverse operations (e.g., since 5 + 6 = 11, then 11 – 6 = 5).	If □ + ○ = ☆ , then ☆ – ○ = □
Multiplication and division are inverse operations (e.g., since 3 x 7 = 21, then 21 ÷ 7 = 3).	If □ x ○ = ☆ , then ☆ ÷ ○ = □
Adding 0 to or subtracting 0 from any number does not change the number's value (e.g., 6 + 0 = 6; 7 – 0 = 7).	□ + 0 = □ □ – 0 = □
Multiplying or dividing a number by 1 does not change the number's value (e.g., 8 x 1 = 8, 7 ÷ 1 = 7).	□ x 1 = □ □ ÷ 1 = □
Any number subtracted from itself results in 0 (e.g., 9 – 9 = 0).	□ – □ = 0
Any number divided by itself results in 1 (e.g., 8 ÷ 8 = 1).	□ ÷ □ = 1
The product of any number and 0 is 0 (e.g., 4 x 0 = 0)	□ x 0 = 0
Numbers can be added in any order without affecting the sum (e.g., 2 + 58 = 58 + 2).	□ + ○ = ○ + □
In addition, the numbers being added can be regrouped in any way without changing the sum. For example, (13 + 4) + 6 = 13 + (4 + 6).	(□ + ○) + ☆ = □ + (○ + ☆)

Planning Guide - Gr. 6 - Preservation of Equality - Click here
See Plan for Instruction and Assessment)

Developing an introduction to variables "What's my Rule?" - Click here
Inverse relationships (multiplication/division), use of variables (pp. 57-64).
Note for teachers:
Although the task is listed as a Gr. 4 task, this is fundamental to understanding variables in relation to equality and algebraic reasoning.