JHS LEARNING ACTIVITY

Name: _____ **Grade/Score:** _____
Grade and Section: _____ **Date:** _____

Subject *(Check or choose from below.)*

- ☐ Religion/Values Education
- ☐ Natural Sciences
- ☐ Araling Panlipunan
- ☐ Filipino
- ☐ English
- ☐ Math
- ☐ TLE / ICT
- ☐ MAPEH
- ☐ HGP _____

Type of Activity *(Check or choose from below.)*_____

- ☐ Concept Notes
- ☐ Skills: Exercise / Drill
- ☐ Performance Task
- ☐ Illustration
- ☐ Formal Theme
- ☐ Informal Theme
- ☐ Others: _____

Activity Title: Determining Large Numbers of Permutations

Learning Target: To apply the equations for large numbers of permutations.

References: *(Author, Title, Pages)*
Florita C. Lamayo, et. al., Integrated Mathematics, pp.237-239
V. G. Baja and M. V. Bernido, CVIF Learning Activities

As we observed in the previous activity, the number of permutations or arrangements of objects can quickly become very large. Simply drawing or using the roster method for elements of sets can become very tedious and tiring. Therefore, it becomes convenient to use mathematical expressions for the permutation. We also introduce the notation for "n-factorial":

$$n! = 1 \times 2 \times 3 \times \ldots n$$

Equations to get permutation:

$_nP_n = n!$ ⟶ the number of permutations of n distinct things.

$_nP_r = \frac{n!}{(n-r)!}$ ⟶ the number of permutations of n things taken r at a time.

Example: Find how many permutations can be made from the letters of the word "superb" if,

a) All letters are used.
b) Three letters are used at a time.

Solution:

Applying the equations for permutation:

a) There are 6 letters in the word "superb". If all are used, then,

$_nP_n = n!$ ⟶ $_6P_6 = 6! = (6)(5)(4)(3)(2)(1) = 720$

b) If 3 letters are used at a time, $r = 3$, we then apply the equation,

$$_nP_r = \frac{n!}{(n-r)!} \longrightarrow {}_6P_3 = \frac{6!}{(6-3)!} = \frac{6!}{3!} = \frac{6(5)(4)(3!)}{3!} = 120.$$

Exercises:

1) How many permutations can be made from all elements of M={m, n, p, r, s} ?
2) In how many ways can 8 teachers be assigned to four Grade 10 sections?
3) How many three-digit numbers can be formed with the digits {1, 2, 3, 4, 5, 6, 7} if no digit is repeated in a number?