Permutations

Eg: In a school trip — Dairy Milk, 5 Star, Milkybar, Gem, ...

50 student

↳ choclate factory { 6 choclates }

Task

$$6 \times 5 \times 4 = 120$$

✓ Dairy Milk, Milky bar, 5 star
✓ Milkybar, Dairy Milk, 5 star
} 1

n = Total # of Object
r = # of objects your are picking

Permutation

n = 6
r = 3

$$^{n}P_{r} = \frac{n!}{(n-r)!}$$

$$= \frac{6!}{(6-3)!}$$

$$= \frac{6 \times 5 \times 4 \times \cancel{3!}}{\cancel{3!}} = 120$$

Combination

n = 6
r = 3

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$$^{n}C_{r} = \frac{n!}{r!(n-r)!} = \frac{6!}{3!(6-3)!}$$

$$= \frac{6!}{3! \times 3!}$$

$$= \frac{6 \times 5 \times 4 \times 3!}{3 \times 2 \times 1 \times 3!}$$

$$= 20 \text{ {unique combination}}$$