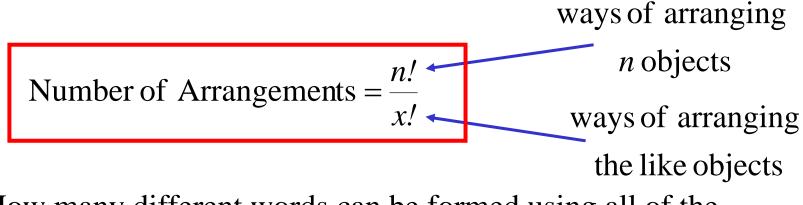


4 objects

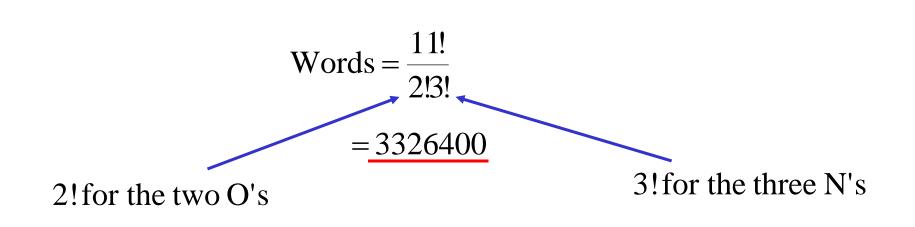
| all different A B C D C B A D | 2 same A A B C | 3 same AAAB |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------|
| A B D C C B D A | ΑΑСΒ | A A B A |
| A C B DC A B DA C D BC A D B | A B A C A B C A | ΑΒΑΑ |
| A D B C D B A | A C A B | ВААА |
| ADCBBBACDDACBACDDACB | A C B A B A A C | 4 |
| JACJACBADCDABC | B A C A | |
| BCADCABBCDADCBA | B C A A C A A B | |
| b C b A b C b A b D C b A b C b A b D A C b B A C | C A A B C A B A | 4 same |
| B D A B D B A B | C B A A | AAAA |
| 4! = 24 | 12 | 1 |

If we arrange *n* objects in a line, of which *x* are alike, the number of ways we could arrange them are;



e.g. How many different words can be formed using all of the letters in the word

CONNAUGHTON ?



2001 Extension 1 HSC Q2c)

The letters A, E, I, O and U are vowels

(*i*) How many arrangements of the letters in the word **ALGEBRAIC** are possible?

Words
$$= \frac{9!}{2!}$$
$$= 181440$$

(*ii*) How many arrangements of the letters in the word ALGEBRAIC are possible if the vowels must occupy the 2nd, 3rd, 5th, and 8th positions?

