8-1 : Patterns + Sequences

* In workbook : page 505
  - complete investigations as a small group
  - notice the patterns that emerge.

↳ All tables : Top row : 1, 2, 3, 4, 5
Bottom row : A sequence of numbers made up by terms

ex.

Row	1	2	3	4	5
cards	3	6	9	12	15

This is term 1 or t_1

term 3 t_3

Ex. Complete the table, State the pattern. Predict t_6 + t_7

a)

n	1	2	3	4	5
t_n	4	8	12	16	20

- increases by 4
- $t_6 = 24$ $t_7 = 28$

b)

n	1	2	3	4	5
t_n	30	27	24	21	18

- decreases by 3
  increase by (−3)
- $t_6 = 15$ $t_7 = 12$

* These are called Arithmetric Sequences

↳ They are formed by adding a constant (pos. or neg) to the previous term.

c)

n	1	2	3	4	5
t_n	2	4	8	16	32

- multiply by 2
- $t_6 = 64$ $t_7 = 128$

d)

n	1	2	3	4	5
t_n	1	-3	9	-27	81

- multiply by -3
- $t_6 = -243$ $t_7 = 729$

- these are called <u>geometric</u> <u>sequences</u>
  - ↳ They are formed by multiplying the previous term by a constant.

* Other sequences exist <u>ex</u>. Perfect squares
Primes
Fibonacci 1, 1, 2, 3, 5, 8, 13, ...

* <u>Finite</u> sequence : <u>Ends</u>! specific number of terms

* <u>Infinite</u> sequence : <u>unlimited</u> number of terms.

We can look at sequences as <u>FUNCTIONS</u>!

↳ Domain (x) = natural numbers (n)

↳ Range (y) = Terms (t_n)