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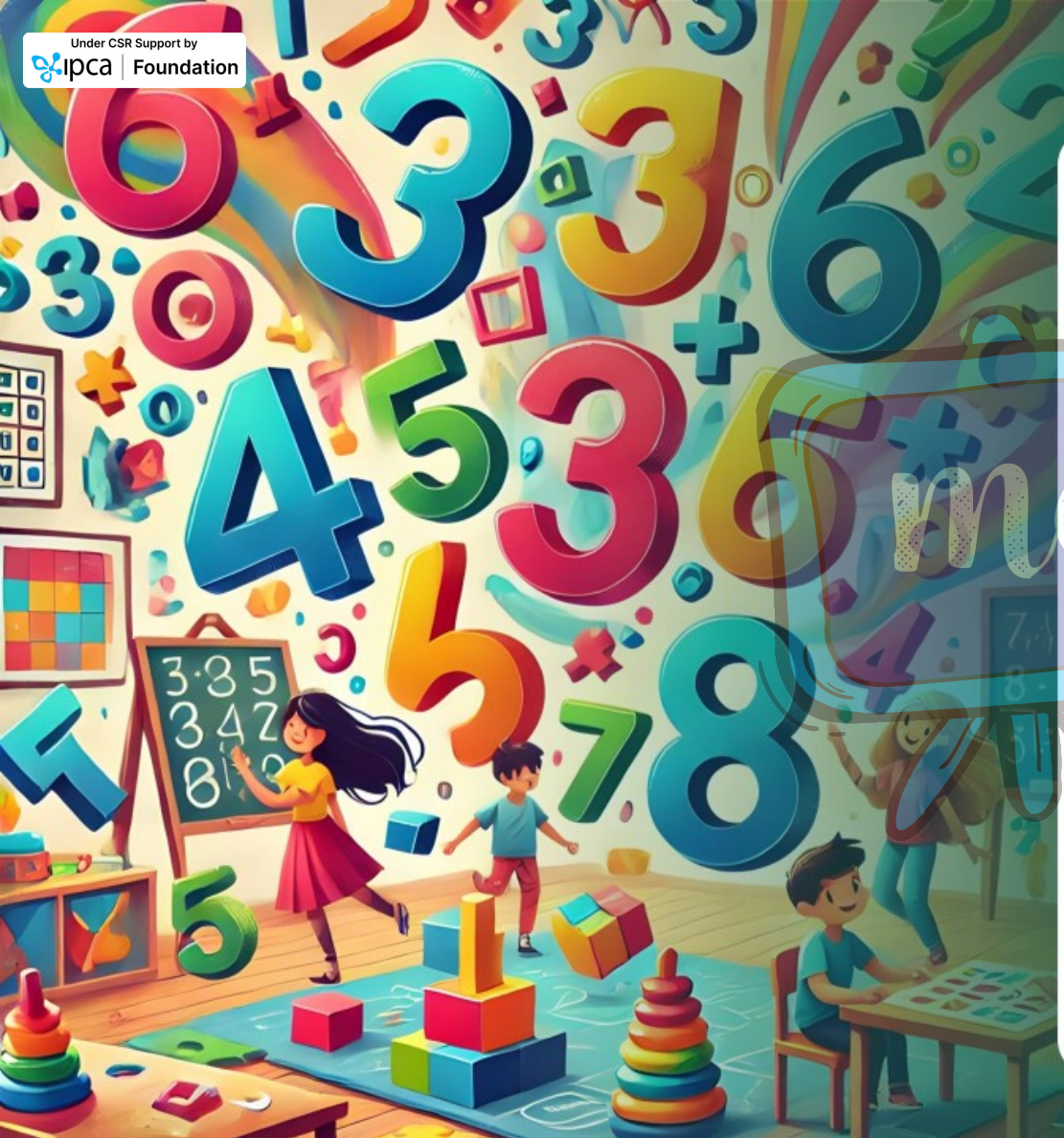

CLASS – 6

MATHEMATICS

Chapter – 3

Number Play

Part – 12

Collatz Conjecture

Lavish Aggarwal

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OVERVIEW

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1. Numbers
2. Supercell
3. Pattern of Numbers on Number Line
4. Playing with Digit
5. Palindromic Pattern
6. Magic Number of Kaprekar
7. Mental Math
8. Playing with Number Pattern

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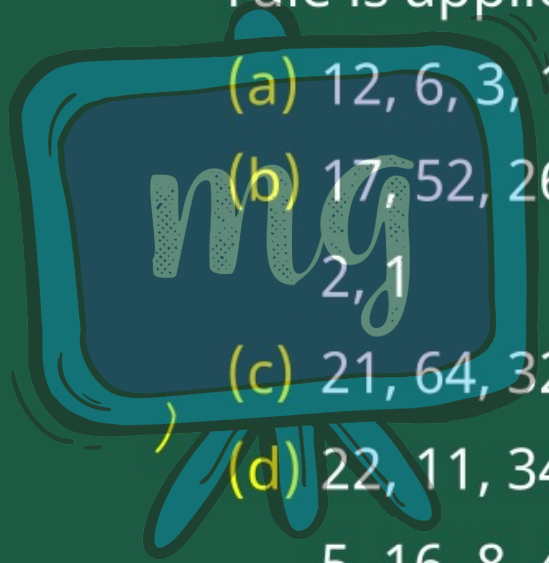

Look at the sequences below the same rule is applied in all the sequences:

(a) 12, 6, 3, 10, 5, 16, 8, 4, 2, 1

(b) 17, 52, 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, 1

(c) 21, 64, 32, 16, 8, 4, 2, 1

(d) 22, 11, 34, 17, 52, 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, 1

Do you see how these sequences were formed?

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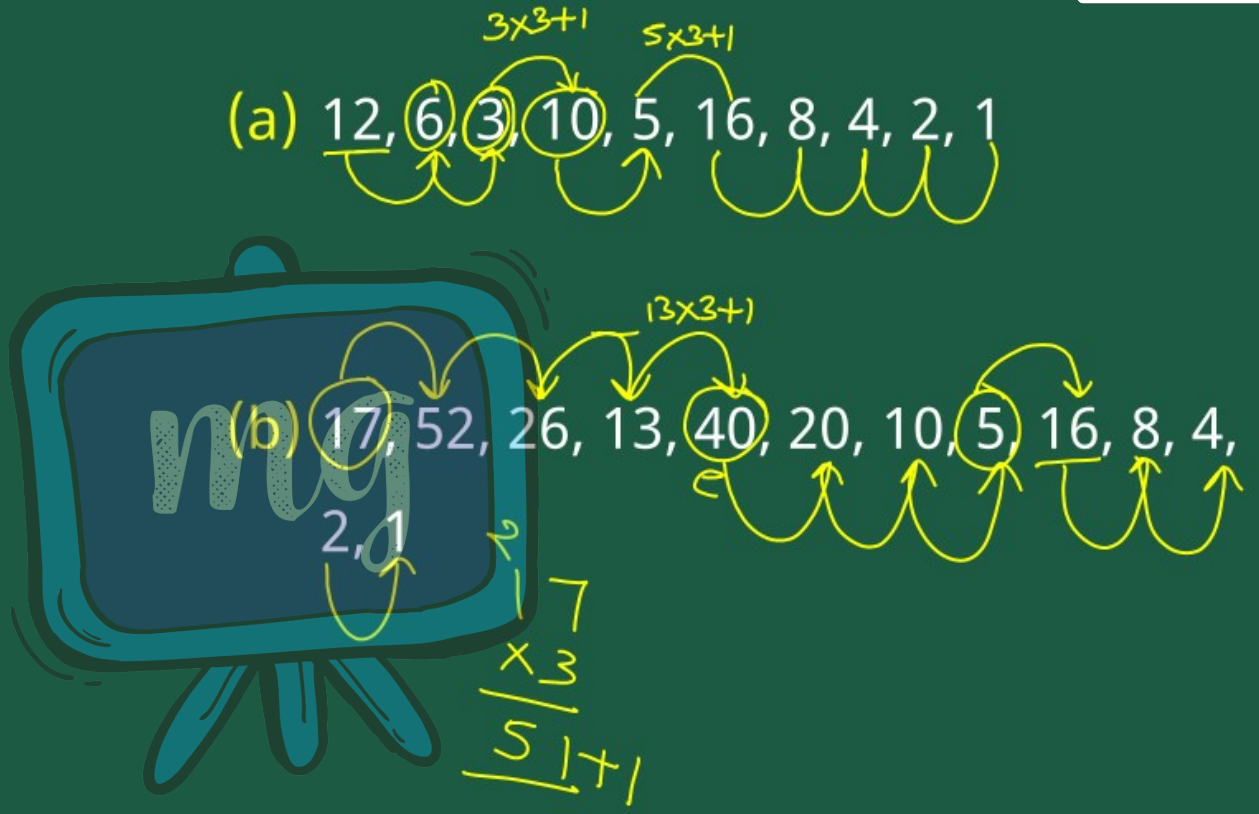

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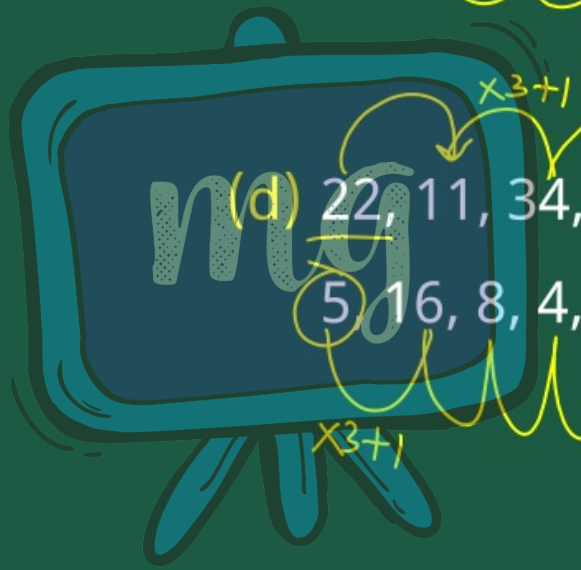
(c) 21, 64, 32, 16, 8, 4, 2, 1



(d) 22, 11, 34, 17, 52, 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, 1

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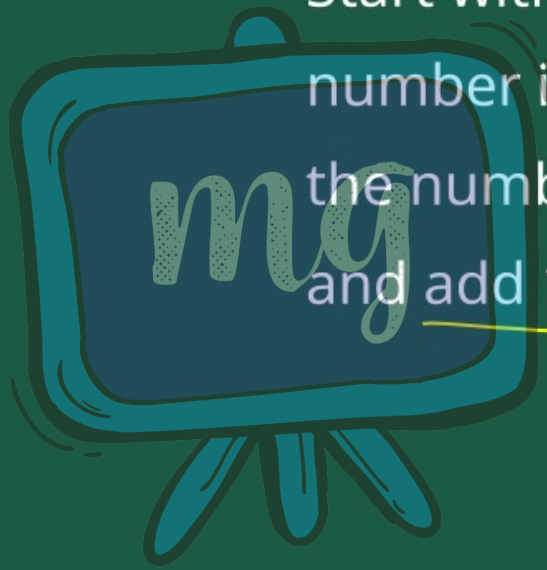
Rule :

Start with any number if the number is even, take half of it; if the number is odd, multiply it by 3 and add 1; repeat.



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AN UNSOLVED MYSTERY – THE COLLATZ CONJECTURE!

German mathematician, Lothar Collatz conjectured that the sequence will always reach 1, regardless of the whole number you start with.

- 12, 6, 3, 10, 5, 16, 8, 4, 2, 1
- 21, 64, 32, 16, 8, 4, 2, 1

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LEARNING OUTCOME

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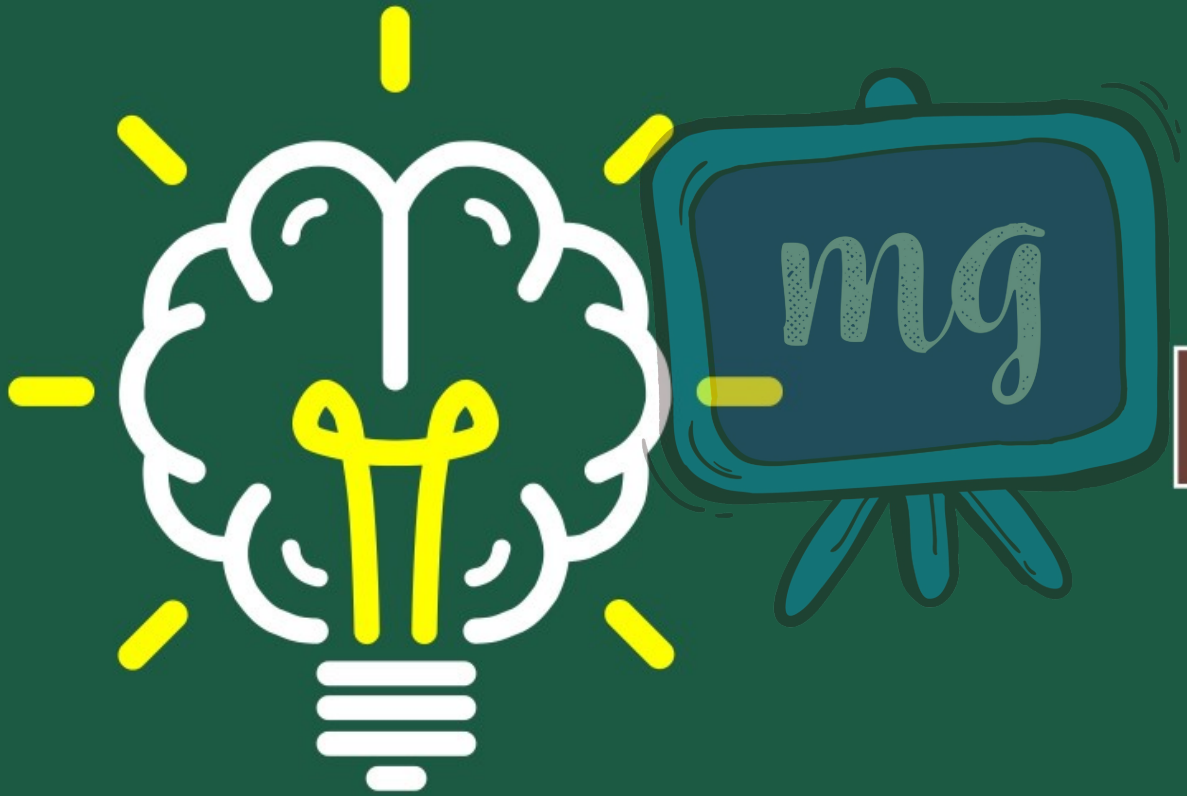

Collatz Conjecture

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ASSESSMENT

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Rule:

odd = x3+1

even = Half

1 Make some more Collatz sequences like those above, starting with your favourite whole numbers. Do you always reach 1?

33 → 100 — 50 — 25 → 76 → 38 → 19 — 58

29 — 88 — 44 — 22 — 11 → 34 — 17 → 52

26 — 13 — 40 — 20 — 10 — 5 — 16 — 8

4 — 2 — 1