NCERT – GRADE 8 CHEAT SHEET:

# GROWTH & COMPOUNDING

(Simple Interest, Compound Interest, & Growth)




## 1 TOPIC SNAPSHOT

**Simple Interest** is calculated only on the Principal.
A **Compounding Growth** is calculated on the principal.

**Compounding Growth** is calculated on the Principal Plus any previously accumulated interest at deccoundat intervals.

## 2 KEY CONCEPTS

**Principal (P):** Original sum of money.

**Rate of Interest (R):** Annual percentage rate of interest.

**Time (T or n):** Time period (usually in years).

**Interest (I):** Extra money paid or earned.

**Amount (A):** The final total sum (A = P + Interest).

## 3 GROWTH WITH COMPOUNDING

**Compound Interest Formula:**

$$A = P\left(1 + \frac{R}{100}\right)^n \qquad CI = A - P$$

**Example:** P = ₹5000, R = 10%, n = 2 years
**Calculation:** A = ₹5000(1.1)² = ₹6050.
CI = ₹1050.

## 4 GROWTH WITHOUT COMPOUNDING

**Simple Interest Formula:**

$$SI = \frac{P \times R \times T}{100} \qquad A = P + SI$$

**Example:** P = ₹5000, R = 10%, T = 2 years
**Calculation:** SI = ₹1000.
A = ₹6000.

## 5 FORMULAE & PROPERTIES

| BASIS | SI | CI |
|---|---|---|
| **Interest Calculation:** | On original Principal only. | On P + accumulated Interest. |
| **Interest Amount:** | Constant every period. | Increases every period. |
| **Growth Type:** | Linear Growth (straight line). | Exponential Growth (curved line). |

**AMOUNT formulas for Compounding Frequencies**

| Annually: | Half-Yearly: | Quarterly: |
|---|---|---|
| $A = P\left(1 + \frac{R}{100}\right)^n$ | $A = P\left(1 + \frac{R}{200}\right)^{2n}$ | $A = P\left(1 + \frac{R}{400}\right)^{4n}$ |
| | | **Note:** CI = A – P |

## 6 EXAM FOCUS & HOTSPOTS

**KEY QUESTIONS:**

- Finding the difference between CI and SI
- Calculate rate or time
- Population growth/depreciation problems
- Population growth/depreciation problems

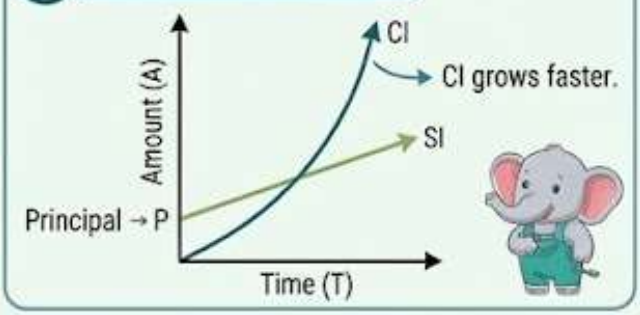
**Note:** Growth rate vs depreciation rate in growth rates ns depreciation rate is difference of growth rate.

## 7 REAL-LIFE APPLICATIONS OF COMPOUNDING

- **Banking:** Savings, fixed deposits
- **Investments:** Stock growth
- **Population Growth:** Increasing numbers
- **Depreciation:** Value reduction



## 8 VISUAL MEMORY AID




## 9 30-SECOND RAPID REVISION

- Identify P, R, T/n.
- **SI formula:** $SI = \frac{P \times R \times T}{100}$
- **CI Amount (Annual):** $A = P\left(1 + \frac{R}{100}\right)^n$
- **Half-Yearly:** R halved, n doubled.
- **Growth Rate (+) vs Depreciation Rate (-)**
- **Key Idea:** Interest is added each period.

## 10 KEY TAKEAWAY

The summarizes the power of compounding for long-term growth. Compound interest, and its significance over simple interest.

**Remember:** Always identify variables before calculating. CI is always greater than or equal to SI for same P, R, T (for T ≥ 1 yr).