7B – Modelling Linear Growth and Decay as an Arithmetic Sequence

**SIMPLE INTEREST INVESTMENT (as an arithmetic sequence)**

If you invest an initial amount of money (V0) at a simple interest rate (r %), the amount of interest earned each year is the **common difference** (D) between the terms:

The value of the investment over time can then be represented by the recurrence relation:

*For a simple interest investment of $3500 at 4.2% per annum, calculate the common difference and then write a recurrence relation for the value of the investment:*

*Use the recurrence relation in NestList to calculate the value of the investment over a 4-year period:*

V0 = V1 = V2 = V3 = V4 =

**FLAT RATE DEPRECIATION (as an arithmetic sequence)**

If an asset depreciates (loses value) by a flat rate of r%, the amount of value it loses each time period is the **common difference** between the terms:

The value of the asset over time can then be represented by the recurrence relation:

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**FLAT RATE DEPRECIATION (continued)**

*A car with a purchase price of $18500 depreciates at a flat rate of 10% per annum. Calculate the common difference and then write a recurrence relation for the value of the car:*

*Use the recurrence relation in NestList to calculate the value of the car over a 4-year period:*

V0 = V1 = V2 = V3 = V4 =

**UNIT COST DEPRECIATION (as an arithmetic sequence)**

If an asset depreciates (loses value) by a fixed dollar amount for a particular number of times it is used, the amount of value it loses is the common difference between the terms.

The value of the asset over time can then be represented by the recurrence relation:

*An office printer purchased for $9200 depreciates at a unit cost of $15 per 100,000 sheets printed.*

*Write a recurrence relation for the value of the printer:*

*Use the recurrence relation in NestList to calculate the value of the printer up to 400,000 sheets printed:*

V0 = V1 = V2 = V3 = V4 =