Methods for Calculating Depreciation

Depreciation is the accounting process of allocating the cost of a tangible asset over its useful life. It represents how much of an asset's value has been used up. Here are the four primary methods used in accounting.

1. Straight-Line Depreciation

This is the simplest and most commonly used method. It spreads the cost of the asset evenly over its estimated useful life.

Formula

Annual Depreciation Expense = Cost - Salvage Value / Useful Life

- **Cost:** The purchase price of the asset.
- **Salvage Value:** The estimated value of the asset at the end of its life.
- **Useful Life:** The number of years the asset is expected to be productive.

Example

A company buys a delivery van for $30,000. It expects to use the van for 5 years and sell it for $5,000 at the end.

- **Calculation:** $30,000 - 5,000) / 5 = $5,000 per year.

2. Double-Declining Balance (DDB)

This is an **accelerated depreciation** method. It results in higher depreciation expenses in the early years and lower expenses in later years. It is often used for assets that lose value quickly, like technology or vehicles.

Formula

1. **Calculate Straight-Line Rate:** 1 / Useful Life
2. **Calculate DDB Rate:** 2 times Straight-Line Rate
3. **Annual Expense:** Beginning Book Value times DDB Rate

Note: Salvage value is not used in the initial rate calculation, but the asset is never depreciated below its salvage value.

Example

Using the same $30,000 van 5-year life, $5,000 salvage:

- **Straight-Line Rate:** 1 / 5 = 20 %
- **DDB Rate:** 20 % times 2 = 40 %

- **Year 1 Expense:** $30,000 x 40 % = $12,000
- **Year 2 Expense:** ($30,000 - $12,000) x 40 % =$7,200

3. Units of Production

This method links depreciation to the actual usage or productivity of the asset rather than the passage of time.

Formula

1. **Depreciation per Unit:** (Cost - Salvage Value) / Estimated Total Units
2. **Annual Expense:** Units Produced in Year x Depreciation per Unit

Example

A factory machine costs $50,000, has a salvage value of $10,000$, and is expected to produce 100,000 units over its life.

- **Rate per Unit:** ($50,000 - $10,000) / 100,000 = $0.40 per unit.
- **Year 1 Production:** If it produces 15,000 units, the expense is 15,000 x $0.40 = $ 6,000.

4. Sum-of-the-Years' Digits (SYD)

SYD is another accelerated method. It uses a fraction based on the remaining years of the asset's life.

Formula

1. **Sum of Digits:** If the life is n years, the sum is 1 + 2 + ...+n.

2. **Annual Expense:** (Cost - Salvage Value) x (Remaining Useful Life / Sum of the Years' Digits)

Example

A piece of equipment costs $ 16,000 with a 5-year life and $1,000 salvage value.

- **Sum of Digits:** 1+2+3+4+5 = 15.
- **Year 1 Expense:** ($16,000 - $1,000) x 5/15 = $5,000.
- **Year 2 Expense:** ($16,000 - $1,000) x 4/15 = $4,000.

Summary Comparison

Method	Best For	Pattern

Straight-Line	Assets with steady utility	Equal annual expense
Double-Declining	Tech/Vehicles (fast obsolescence)	Front-loaded expense
Units of Production	Manufacturing/Machinery	Based on usage
Sum-of-the-Years	Assets most productive when new	Accelerated, but smoother than DDB