

AFA100: Depreciation Methods

TRAIN TO LEARN EFFECTIVELY: TIP SHEETS CONTENT BY: SHAYAAN LALANI

Big idea

Depreciation is the process of allocating the cost of a long-lived asset over the periods that benefit from using it. It is not a cash payment and it is not meant to show the exact market value of the asset.

Before you calculate, identify these amounts

- **Cost:** Purchase price plus reasonable and necessary costs to get the asset ready for use.
- **Residual value:** Estimated value at the end of the asset's useful life. This part is not depreciated.
- **Useful life:** Expected life in years, or total expected production/use.
- **Accumulated depreciation:** Total depreciation recorded since the asset was purchased.

Core formulas and account effects

- **Depreciable cost:** Cost - Residual value
- **Carrying amount / net book value:** Cost - Accumulated depreciation
- **Depreciation entry:** Dr Depreciation Expense; Cr Accumulated Depreciation
- **Stop rule:** Depreciation stops when carrying amount equals residual value.
- **Land rule:** Land is not depreciated.

1. Comparing the three methods

Method	When it makes sense	Formula	Pattern of Expense
Straight-line	The asset provides benefits fairly evenly over time.	$(\text{Cost} - \text{Residual value}) / \text{Useful life in years}$	Same amount each year
Units-of-production	Wear and tear depends more on use/output than time.	$[(\text{Cost} - \text{Residual value}) / \text{Estimated total units}] \times \text{Actual units}$	Changes with production or use
Double declining-balance	The asset is more useful or used more heavily in earlier years.	$\text{Beginning carrying amount} \times (2 / \text{Useful life in years})$	Higher expense early, lower expense later

Memory Shortcut

- Straight-line = time
- Units-of-production = activity
- Double declining-balance = accelerated depreciation

AFA100: Depreciation Methods

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2. Straight-line method

Use this when the asset is expected to provide about the same benefit each year. The expense is constant each year.

Formula

$$\text{Depreciation expense per year} = (\text{Cost} - \text{Residual value}) / \text{Useful life in years}$$

Example setup

- Cost = \$28,000,000
- Residual value = \$6,000,000
- Useful life = 20 years
- Year-end = December 31

Calculation

- $\$28,000,000 - \$6,000,000 = \$22,000,000$
depreciable cost
- $\$22,000,000 / 20 \text{ years} = \$1,100,000 \text{ per year}$
- If purchased July 1: $\$1,100,000 \times 6/12 = \$550,000$

3. Units-of-production method

Use this when depreciation should follow how much the asset is used. The key is to calculate a depreciation rate per unit first.

Formula

$$\text{Depreciation expense} = [(\text{Cost} - \text{Residual value}) / \text{Estimated total production}] \times \text{Actual production}$$

Example setup

- Cost = \$28,000,000
- Residual value = \$6,000,000
- Estimated total production = 40,000 flights
- Actual production in 2024 = 2,100 flights

Calculation

- $\$22,000,000 / 40,000 \text{ flights} = \550 per flight
- $\$550 \times 2,100 \text{ flights} = \$1,155,000 \text{ depreciation expense}$

Exam tip

Always match the unit in the problem. If the asset life is given in kilometres, use actual kilometres. If it is given in units produced, use actual units produced.

AFA100: Depreciation Methods

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4. Double declining-balance method

Use this when the asset is expected to be more productive or useful in earlier years. This is an accelerated method, so depreciation is larger at the beginning and smaller later.

Formula

Depreciation expense = Beginning carrying amount x (2 / Useful life in years)

Beginning carrying amount = Cost - Accumulated depreciation at the beginning of the year.

Example setup

- Cost = \$28,000,000
- Residual value = \$6,000,000
- Useful life = 20 years
- Year-end = December 31
- DDB rate = $2 / 20 = 10\%$

Calculation

- 2024: $\$28,000,000 \times 10\% = \$2,800,000$
- Ending carrying amount = $\$28,000,000 - \$2,800,000 = \$25,200,000$
- 2025: $\$25,200,000 \times 10\% = \$2,520,000$

Exam tip

Do not subtract residual value in the yearly DDB formula. Use residual value as a floor: adjust the final depreciation so the carrying amount does not go below residual value.

5. How to approach any depreciation question

1. Underline the method: straight-line, units-of-production, or double declining-balance.
2. List the given amounts: cost, residual value, useful life, total production, actual production, purchase date, and year-end.
3. Calculate depreciable cost only when the method uses it: straight-line and units-of-production.
4. For partial years, multiply annual depreciation by the fraction of the year the asset was used.
5. Update accumulated depreciation and carrying amount after each year.
6. Check the residual value floor. Depreciation should not reduce the carrying amount below the residual value.

6. Statement impact

Financial statement	What changes?	Interpretation
Income statement	Depreciation expense increases.	Net income decreases.
Statement of financial position	Accumulated depreciation increases; carrying amount decreases.	The asset is shown at net book value, not original cost alone.
Statement of cash flows	Depreciation itself is non-cash.	No cash is paid when depreciation is recorded.

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7. Changes in depreciation estimates

Sometimes useful life, residual value, or the asset cost changes after purchase. For example, a major improvement may be added to the asset cost, or the estimated useful life may be revised.

Rule for estimate changes

Do not redo previous years. Use the new information for the current and future years only.

Straight-line after an estimate change

New depreciation = (Current carrying amount - New residual value) / Remaining useful life

8. Common mistakes to avoid

Formula mistakes

- Subtracting residual value in DDB every year.
- Using cost instead of the beginning carrying amount for DDB after year 1.
- Forgetting partial-year depreciation when the asset is purchased mid-year.
- Using useful life in years for units-of-production instead of total estimated units.

Concept mistakes

- Depreciating land.
- Calling accumulated depreciation an expense. It is a contra-asset.
- Thinking depreciation is a cash outflow. The cash was usually paid when the asset was acquired.
- Depreciating below residual value.

9. Practice problem

Try this first

A company buys a delivery van on January 1 for \$42,000. The van has an estimated residual value of \$6,000, a 6-year useful life, and an estimated total use of 180,000 km. In year 1, the van is driven 32,000 km.

Questions

1. Calculate year 1 depreciation using straight-line.
2. Calculate year 1 depreciation using units-of-production.
3. Calculate year 1 depreciation using double declining-balance.
4. Calculate the carrying amount at the end of year 1 under DDB.

Answer key

- Straight-line: $(\$42,000 - \$6,000) / 6 = \$6,000$
- Units rate: $(\$42,000 - \$6,000) / 180,000 \text{ km} = \0.20 per km
- Units expense: $\$0.20 \times 32,000 \text{ km} = \$6,400$
- DDB rate: $2 / 6 = 33.33\%$
- DDB expense: $\$42,000 \times 33.33\% = \$14,000$
- DDB ending carrying amount: $\$42,000 - \$14,000 = \$28,000$