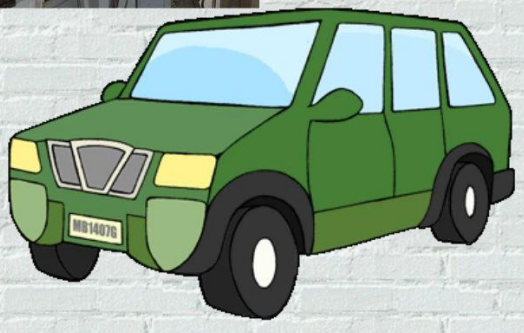
# Plant Assets

Depreciation,
Depletion,
& Amortization



# Plant and Equipment

Long Term Assets are those that are

1. used in production of goods or services
2. have a useful life of more than one year
3. are not intended for resale to customers

Long Term Assets can be divided into three categories:

1. Tangible Assets
   Buildings, machinery, automobiles, etc.
2. Natural Resources
   Oil, Timber, Cotton Fields, etc.
2. Intangible Assets
   Patents, trademarks, goodwill, copyrights, leaseholds, franchises, etc.

We will only concern ourselves with Tangible Assets .

Tangible Assets

Depreciate

Natural Resources

Deplete

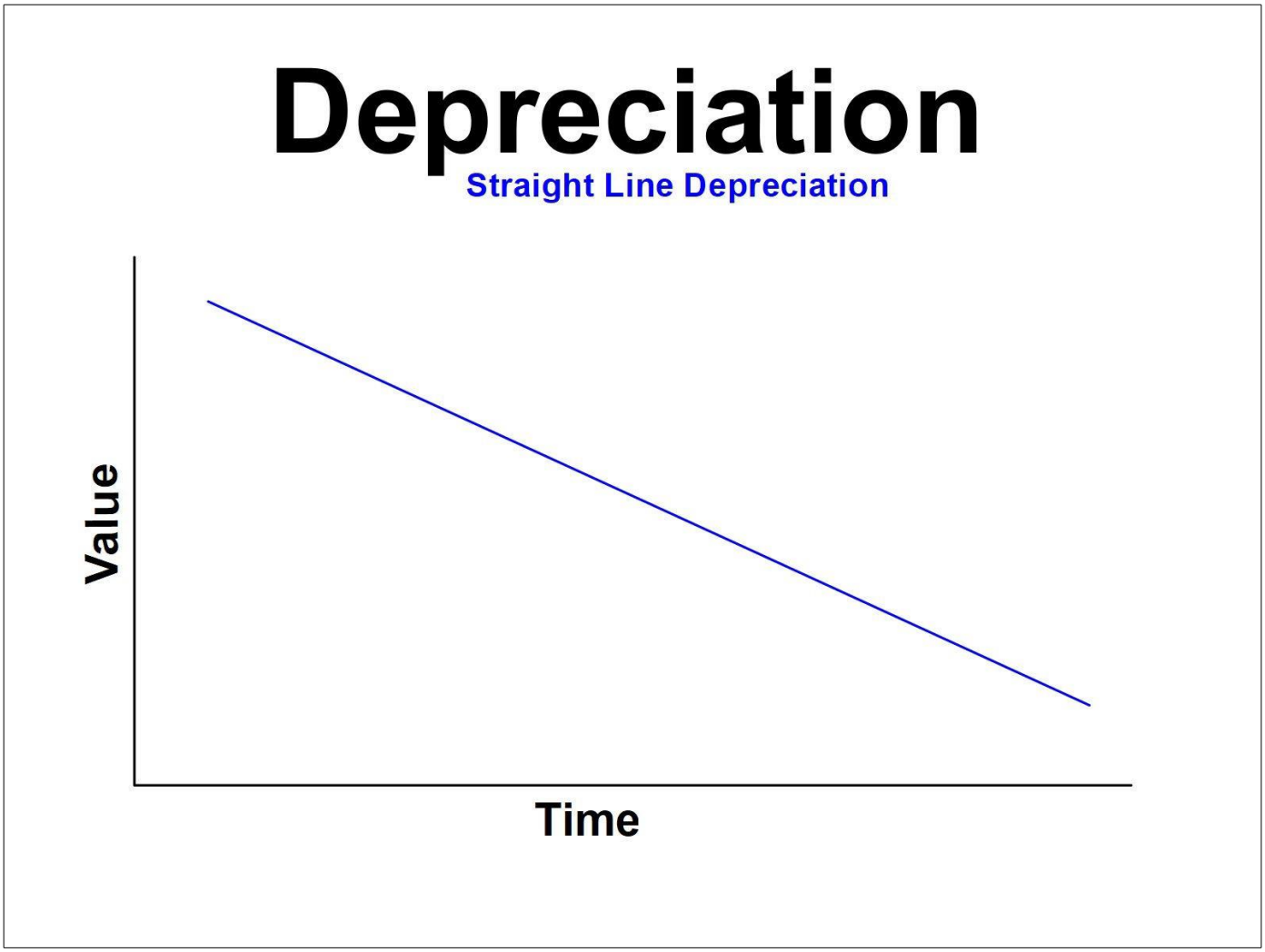
Intangible Assets

Amortize

**Land**

**is never depreciated!**

…because it is assumed to have an unlimited lifespan.




Loss of value under Straight-Line depreciation occurs at the same rate over time.

# Depreciation

## Straight Line Depreciation

A machine that originally cost $700 has a salvage value of $200 and a service life of 5 years. Calculate the yearly depreciation on the machine.

$$\frac{\text{Cost - Salvage Value}}{\text{Useful Life}} = \frac{700-200}{5} = \$100 \text{ depreciation/year}$$

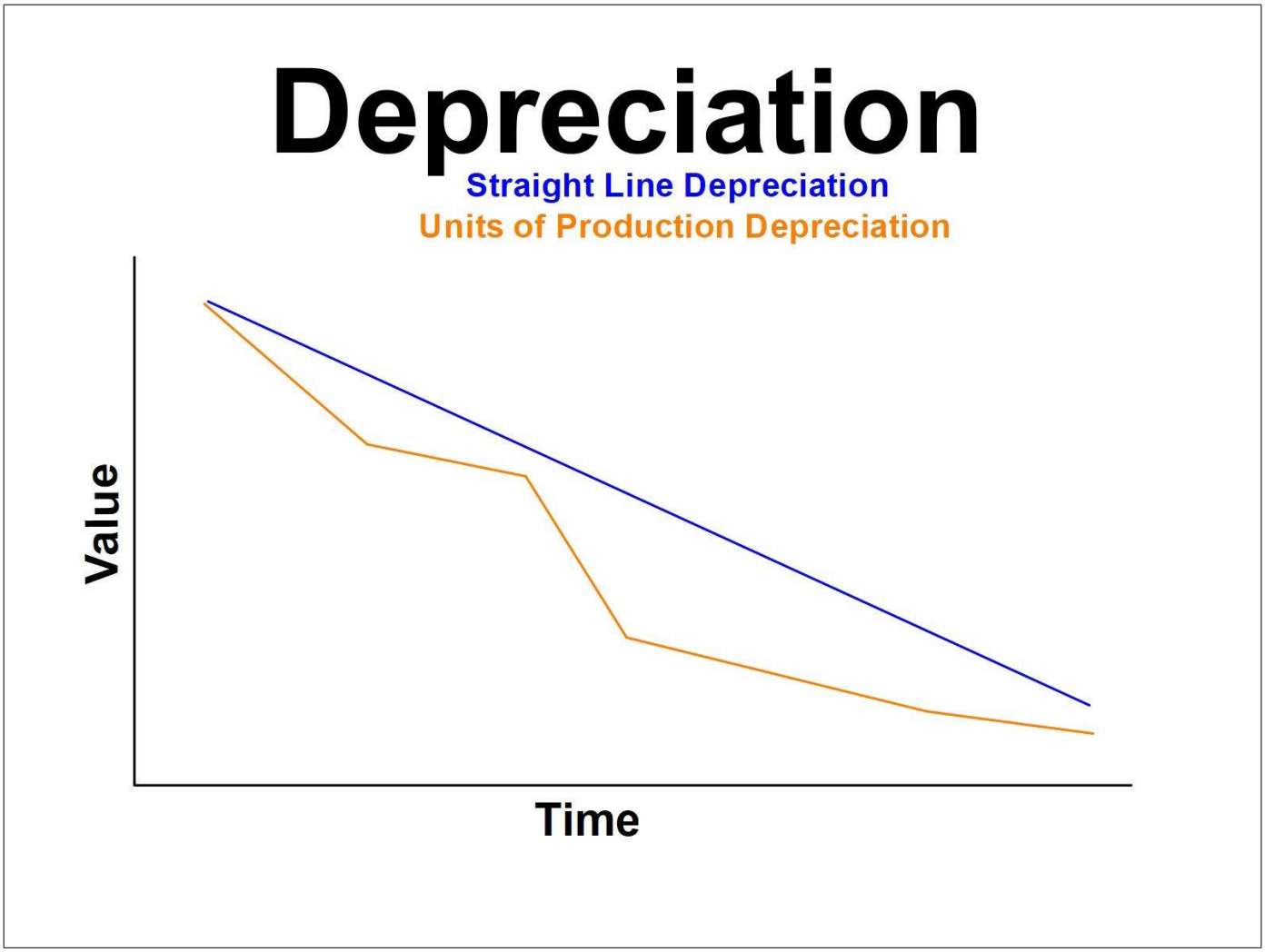
Depreciation Expense $100
Accumulated Depreciation $100

Terms:

| | |
|---|---|
| Depreciation | Accumulated Depreciation |
| Service Life | Salvage Value |
| Depreciable Cost | Carrying Value/Book Value |

Remember the Depreciation Adjustment as one of the five we learned about in the Adjustments unit?

You should be aware of what these terms are referring to.




Under the Units of Production method, the machine's actual use or production of units determines how quickly it depreciates. Therefore the value would go down more irregularly depending on the frequency of use in a given year.

# Units of Production Method

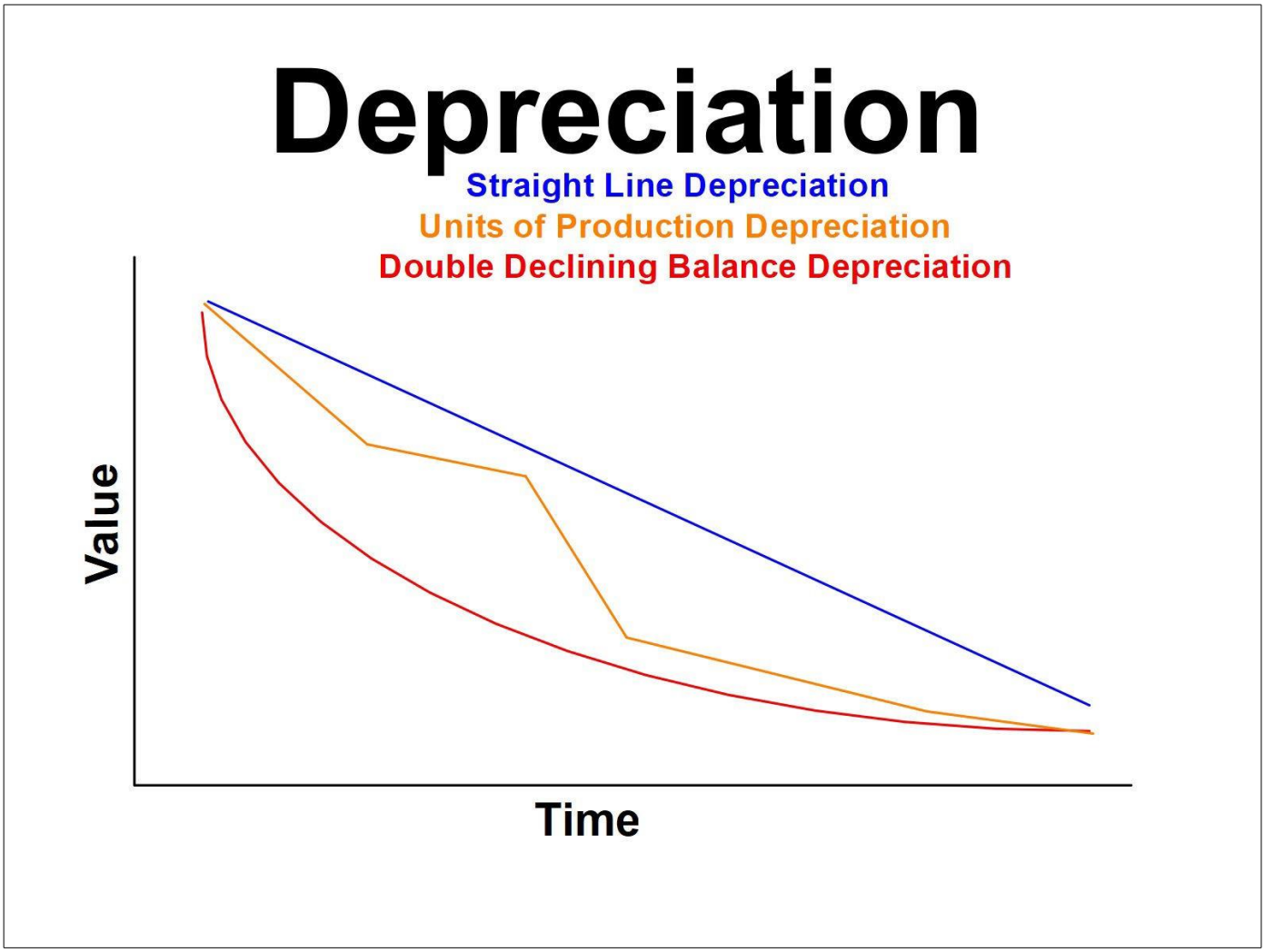
A machine that cost $1,000 will produce the following in each of its 3 productive years:

Year 1: 100 units
Year 2: 300 units
Year 3: 200 units

The machine will have a salvage value of $100. What's the depreciation for each year under the units of production method?

$$\frac{1000 - 100}{600} = \$1.50 \text{ depreciation per unit}$$

Year 1 = 100 x $1.50 = $150
Year 2 = 300 x $1.50 = $450
Year 3 = 200 x $1.50 = $300
$900




With the Double-Declining Balance method, depreciation occurs very quickly at the beginning of the asset's life and then slows down as it gets older. The assumption here is that the asset would be used more when it is first purchased and then become less useful as it ages.

# Double Declining Balance Method

**A company buys a plane for $1,000,000. The asset has a residual value of $200,000 and a useful life of 4 years. Calculate depreciation for each of the 4 years of its life using the double declining balance method.**

$$\frac{\$1{,}000{,}000 - 200{,}000}{4} = 200{,}000$$

$$\frac{200{,}000}{800{,}000} = .25$$

(or 1/4 = .25)

.25 x 2 = .50

Year 1 = 1,000,000 x .50 = 500,000
Year 2 = (1,000,000 - 500,000) x .50 = 250,000
Year 3 = (1,000,000 - 500,000 - 250,000) = ~~125,000~~ 50,000

The tricky part of this method is that the asset cannot depreciate such that BOOK VALUE (asset cost – accumulated depreciation) cannot be less than residual/salvage value. That should make sense if you think about it. Therefore, we sometimes have to adjust the final depreciation to result in ending book value at salvage. In this example, year 3 depreciation was calculated at 125,000 but we had to change it to 50,000. There would be no depreciation in year 4 because the asset was already fully depreciated by the end of year 3.

# Depreciation Example

**Larson Manufacturing Company purchased a robot at a cost of $1,440,000 at the beginning of year 1. The robot had an estimated useful life of 4 years and an estimated residual value of $120,000. The robot, which should last 20,000 hours, was operated 6,000 hours in year 1, 8,000 hours in year 2, 4000 hours in year 3, and 2000 hours in year 4.**

**1. Compute annual depreciation and carrying (book) value for the robot for each year assuming the following depreciation methods: a) straight-line, b)units of production, & c)double-declining balance.**

**2. Prepare the adjusting entry that would be made each year to record the depreciation calculated under the straight line method.**

**3. Identify the book value for the robot after year 2 under the straight line method.**

# Depreciation Example

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**1. Compute annual depreciation and carrying (book) value for the robot for each year assuming the following depreciation methods: a) straight-line, b)units of production, & c)double-declining balance.**

1. Straight Line: (1,440,000-120,000)/4 = $**330,000 depr./year**

   Book year 1: 1,440,000 – 330,000 = **$1,110,000**

   Book year 2: 1,110,000 – 330,000 = **$780,000**

   Book year 3: 780,000 – 330,000 = **$450,000**

   Book year 4: 450,000 – 330,000 = **$120,000**

Units of Production: (1,440,000 – 120,000)/20,000 = $66 depr./unit

year 1: $66 x 6000 = **$396,000 depreciation**

Book =1,440,000 – 396,000 = **$1,044,000**

year 2: $66 x 8000 = **$528,000 depreciation**

Book = 1,044,000 – 528,000 = **$516,000**

year 3: $66 x 4000 = **$264,000 depreciation**

Book = 516,000 – 264,000 = **$252,000**

year 4: $66 x 2000 = **$132,000 depreciation**

Book = 252,000 – 132,000 = **$120,000**

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**1. Compute annual depreciation and carrying (book) value for the robot for each year assuming the following depreciation methods: a) straight-line, b)units of production, & c)double-declining balance.**

1. Double-Declining Balance Method:

One year's depreciation under straight line =
(Cost – Residual Value) / useful life
(1,440,000 – 120,000) / 4 = $330,000

Rate of Depreciation =
(one year's depreciation under straight line)/ depreciable cost
330,000/(1,440,000 – 120,000) = .25 or 25%

Double Declining Balance rate = .25 x 2 = .5 or 50%

# Depreciation Example

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**1. Compute annual depreciation and carrying (book) value for the robot for each year assuming the following depreciation methods: a) straight-line, b)units of production, & c)double-declining balance.**

1. Double-Declining Balance Method:

First year's depreciation =
1,440,000 x .5 = **$720,000**
Book Value = 1,440,000 – 720,000 = **$720,000**
Second year's depreciation =
720,000 x .5 = **$360,000**
Book Value = 720,000 – 360,000 = **$360,000**
Third year's depreciation =
360,000 x .5 = **$180,000**
Book value = 360,000 – 180,000 = **$180,000**
Fourth year's depreciation =
~~180,000 x .5 = $90,000~~
~~Book value = 180,000 – 90,000 = $90,000~~
Since book value cannot be less than residual value the last year's depreciation must be reduced to **$60,000**. This brings the book value down to match residual value (**$120,000**) exactly.

# Depreciation Example

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**1. Compute annual depreciation and carrying (book) value for the robot for each year assuming the following depreciation methods: a) straight-line, b)units of production, & c)double-declining balance.**

**2. Prepare the adjusting entry that would be made each year to record the depreciation calculated under the straight line method.**

**3. Identify the book value for the robot after year 2 under the straight line method.**

2. Depreciation Expense $ 330,000
   Accumulated Depreciation $330,000

# Depreciation Example

**Larson Manufacturing Company purchased a robot at a cost of $1,440,000 at the beginning of year 1. The robot had an estimated useful life of 4 years and an estimated residual value of $120,000. The robot, which should last 20,000 hours, was operated 6,000 hours in year 1, 8,000 hours in year 2, 4000 hours in year 3, and 2000 hours in year 4.**

**1. Compute annual depreciation and carrying (book) value for the robot for each year assuming the following depreciation methods: a) straight-line, b)units of production, & c)double-declining balance.**

**2. Prepare the adjusting entry that would be made each year to record the depreciation calculated under the straight line method.**

**3. Identify the book value for the robot after year 2 under the straight line method.**

3. Depreciation per year under straight line = $330,000

After two years, the accumulated depreciation would be:

$330,000 x 2 = $660,000

And the book value would be:

cost – accumulated depreciation

$1,440,000 - $660,000 = **$780,000**

## Accounting for Disposal of Plant Assts

**Your company purchased a small crane for $58,000. The crane is expected to have a useful life of five years and a residual value of $4,000 at the end of that time. Prepare journal entries to record the disposal of the crane at the end of the second year, assuming that the straight line method is used and making the following additional assumptions.**

**a. The crane is discarded completely.**

Depreciation per year = 58,000 – 4,000 / 5 = $10,800
Accumulated Depreciation after 2 years = 10,800 x 2 = $21,600

Book value after year 2 = 58,000 – 21,600= $36,400

Journal entry for disposal:

| | | |
|---|---|---|
| Accumulated Depreciation | $21600 | |
| Loss on Disposal | $36,400 | |
| Crane | | $58,000 |

## Accounting for Disposal of Plant Assts

**Your company purchased a small crane for $58,000. The crane is expected to have a useful life of five years and a residual value of $4,000 at the end of that time. Prepare journal entries to record the disposal of the crane at the end of the second year, assuming that the straight line method is used and making the following additional assumptions.**

**b. The crane is sold for $40,000 cash.**

Depreciation per year = 58,000 – 4,000 / 5 = $10,800
Accumulated Depreciation after 2 years = 10,800 x 2 = $21,600

Book value after year 2 = 58,000 – 21,600= $36,400
Difference between book value and sales price =
**40,000 – 36,400 = $3,600 gain**

Journal entry for sale:

| | | |
|---|---|---|
| Cash | $40,000 | |
| Accumulated Depreciation | $21,600 | |
| Crane | | $58,000 |
| Gain on Sale | | $3,600 |

## Accounting for Disposal of Plant Assts

**Your company purchased a small crane for $58,000. The crane is expected to have a useful life of five years and a residual value of $4,000 at the end of that time. Prepare journal entries to record the disposal of the crane at the end of the second year, assuming that the straight line method is used and making the following additional assumptions.**

**c. The crane is sold for $32,000 cash.**

Depreciation per year = 58,000 – 4,000 / 5 = $10,800
Accumulated Depreciation after 2 years = 10,800 x 2 = $21,600

Book value after year 2 = 58,000 – 21,600= $36,400
Difference between book value and sales price =
**36,400 – 32,000 = $4,400 loss**

Journal entry for sale:

| | | |
|---|---|---|
| Cash | $32,000 | |
| Accumulated Depreciation | $21,600 | |
| Loss on Sale | $4,400 | |
| Crane | | $58,000 |

# Final Notes on Sales and Disposals:

Always compare the sales price to the book value to determine whether a gain or loss occurred.

If the asset was disposed of, the entire book value is a loss.

If the asset is fully depreciated you can assume that book value equals salvage/residual value.

Debits must always equal credits when you have finished your entry.