**summarize the rules in capital budgeting when using net present value calculations**

* How do firms use money from their capital budgets to invest?
* What is a "project" to a firm?
* How do firm's decide in which projects to invest?

Firms have finite financial resources and therefore have to make [capital budgeting decisions](https://learn.saylor.org/mod/url/view.php?id=7880) about which capital investments to undertake. Capital investments are called projects. Firms have to make choices between which projects in which to invest by ranking projects based on the outcome of [capital budgeting techniques](https://learn.saylor.org/mod/page/view.php?id=7876). To do so, they use project evaluation criteria. The most common project evaluation criteria of [capital budgeting](https://learn.saylor.org/mod/page/view.php?id=7885)are net present value (NPV) and [internal rate of return](https://learn.saylor.org/mod/page/view.php?id=7875) (IRR). However, there are others such as the [payback period](https://learn.saylor.org/mod/url/view.php?id=7877), [modified internal rate of return](https://learn.saylor.org/mod/url/view.php?id=7877), or the average rate of returns.Each [capital budgeting](https://learn.saylor.org/mod/url/view.php?id=7865) technique has its own decision criteria that must be considered after the return has been calculated. Net present valuation uses a technique that is called discounted cash flow valuation. Net present value is a variation on the present value calculation that allows for calculating both cash inflows and outflows and a changing discount rates and maturities. The decision criteria for an NPV calculation is as follows:

If the NPV > 0, accept the project;

If the NPV < 0, reject the project;

If the NPV = 0, accept or reject the project based on preference or other factors.

If more than one project has a positive NPV (an NPV > 0), as a rule, the project with the highest NPV should be accepted.

**use the incremental approach in finance to compare the net present value of a project with the net present value of another project**

* How do we compare the NPV of only 2 projects?

The incremental cost approach is optimal to use when only comparing two projects. It focuses on both cost increases and decreases. For only those costs and revenues that differ between the two projects being considered are the costs and revenues to which discounted cash flow analysis need to be applied. The final result of an incremental [NPV analysis](https://learn.saylor.org/mod/page/view.php?id=7872) should be the same as the final result from using the total cost approach of NPV, which is the more common approach.

**calculate the depreciation expense of an asset and demonstrate how that expense factors into the income statement and cash flow statement**

* What is depreciation?
* How does one record the depreciation of assets?
* Which financial statements contain depreciation?

Once a firm acquires a capital asset, which is often done with the use of capital budgeting techniques, that firm is allowed to account in its financial statements for the deterioration in that asset's usefulness over time. This deterioration in the useful life of an asset is called "depreciation". [Depreciation](https://learn.saylor.org/mod/page/view.php?id=4861) is classified as a "non-cash expense" for accounting purposes, and provides a tax benefit for firms. [Depreciation of an asset](https://learn.saylor.org/mod/page/view.php?id=4862) is an accounting convention that is used to reflect significant loss of value or the loss of performance of an asset due to repeated use or expected maintenance over time. A firm decides based on the asset class how long it can use the asset before it will need to be replaced, re-sold, or otherwise disposed of. That length of time is called the life of the asset. Once the life of the asset is established, that becomes a very important input, almost like a target point, to calculating depreciation. Next, the firm must decide what method of depreciation to use for the asset. There are many calculation methods for depreciation. While straight-line depreciation is the most common, there are [other depreciation methods](https://learn.saylor.org/mod/page/view.php?id=7879), such as MACRS, modified depreciation, unit-of-service depreciation, hours-of-service depreciation, reducing balance, sum of year's digits, and double declining balance.

Straight-line depreciation assumes that the asset will be depreciated to a value of zero by the end of its useful life and that there is no remaining book value which can be recouped from the resell of the asset. An equal amount of depreciation is expensed each year of the asset's life until zero remains as the value of the fixed asset in its final year of life. The value of depreciation expense is constant each year while the fixed asset balance declines and the balance in the accumulated depreciation account grows.

The effect of depreciation can be seen in all three of the major financial statements – the balance sheet, income statement, and [the cash flow statement](https://learn.saylor.org/mod/page/view.php?id=4863). All of the depreciation over time that a company claims is reflected in the accumulated depreciation account on the balance sheet. This account is called a contra-asset. It is listed on the asset side of the balance sheet, below the capital equipment account, which is usually called Property, Plant, and Equipment (PP&E) or a fixed asset. As a contra-asset, the accumulated depreciation account maintains a growing balance, but that a balance decreases the overall asset balance instead of increasing it like a typical asset would do. The accumulated depreciation account is subtracted from the balance in the fixed asset account, which creates an account that is sometimes listed on the balance sheet as a Net Fixed Asset. Whenever you see a net fixed asset account, the effects of depreciation have already been figured into the value of assets on the balance sheet. The balance in the accumulated depreciation account should increase, which the balance in the fixed asset account (or net fixed asset account) should be declining. It is possible for that balance to decline to zero.

Over time, the accumulated depreciation account will grow if assets are being actively depreciated, which means that the fixed asset account will decrease over time. The current value in the accumulated depreciation account reflects the sum of all the depreciation taken over the year or sometimes multiple years for the firm. The difference in the accumulated depreciation accounts on two consecutive years' balance sheets reflects the annual depreciation expense claimed by the firm. The annual depreciation expense is shown on the income statement of the most current year that corresponds to the most current year's balance sheet used to find the change in the accumulated depreciation accounts. When depreciation expense is on the income statement, it is known as a non-cash expense. This means that it is subtracted from sales revenue like all other expenses, but there is no actual cash outflow from the firm for having depreciation expense. Depreciation isn't paid to anyone. The "expensing" of it only happens on paper on the income statement. Expensing depreciation lowers the firm's taxable income, and in that way it provides a tax benefit. This is meant to account for anticipated future repurchases or costs associated with the asset.

The effects of depreciation are far-reaching. When trying to construct a cash flow statement for a firm, it is important to properly separate cash inflow versus outflows and to associate them with the appropriate activities. The first thing to do when assessing the cash inflows from operating activities is to add back the depreciation expense on the income statement, so that the cash flow statement accurately shows that what has been depreciated is not actual cash that has flowed out of the firm. See the depreciation example below.

**calculate the net present value of an investment option**

* What are the components of the NPV formula?
* How can the NPV formula be modified for changes in cash flows over time?

The [net present value](https://learn.saylor.org/mod/page/view.php?id=7872) calculation is a modification on the present value calculation. The major differences are that the equation allows for: 1) cash inflows can be subtracted and these do not have to be discounted; and 2) in each period the years left to maturity will change and any other inputs to the equation can also change such as discount rate, the frequency of compounding, and even the lump sum amount that is being discounted. The equation can be expanded or shortened as needed, as the structure of the project requires.

NPV=∑nt=0CFt(1+r)tNPV=∑t=0nCFt(1+r)t