What is EV/EBITDA?

EV stands for enterprise value. It is the company's market value if it is to be sold.
EBITDA stands for Earnings Before Interests (I), Taxes (T), Depreciation and Amortization (D & A). It is the company's estimated operating cash flow, with I, T, D & A added back to its operating net earnings.

Now, let us define what the meaning of EV/EBITDA ratio.
EV/EBITDA is a enterprise multiple, used to compare companies' value from the same industry in terms of potential growth and operational system. It measures the time length of its ability to pay all of its costs with its earnings.

EV/EBITDA = Enterprise Multiple OR EV = EBITDA x Enterprise Multiple

Johnson & Johnson's ratio was calculated for the fiscal year 2012 as an example:
EV/EBITDA = 12.134x, which means that it takes about 12 years and 1½ months to reimburse its costs with its earnings.

This valuation multiple is useful: debts, interests, depreciation and amortization become indifferent in its calculation, capital structure is ignored (e.g. b/c of EBITDA), and taxes from various international companies are set to null as to compare x to x. It is important to keep in mind the followings:

Low EV/EBITDA = undervalued! AND High EV/EBITDA = overvalued!

What is a company's book value?

The book value is present net value of a company, determined by subtracting all liabilities, intangible assets and preferred stocks from total assets. It is the total amount of money that investors contributed to the business; it is otherwise the cash that shareholders would receive if the entire business was to be liquidated, with debts paid off. Note that equity's daily price changes do not alter the book value.

Finding the book value of a company can be useful when applied in financial ratios, such as Market-to-Book ratio: it can inform the investors if the enterprise's stock is overvalued or undervalued, compared to the other companies' equity from the same industry.

What is free cash flow?

Free Cash Flow (FCF) looks at the stream of cash made and used by a company. Otherwise said, it is the amount of money after the capital expenditure (e.g. taxes, operating costs, etc.) has been subtracted from its operating cash flow. A company's FCF is useful for debt payment, future expansion, product development and other future expenses.

A negative FCF or a much higher FCF than the ones from other companies from the same industry means that the total cash of the concerned company is not being managed properly. The business might be failing to meet its purposes/be having too many debts or be holding on too much money without investing it back to certain areas (ex. in research) of its business. Hence, it is important for investors to analyze the FCF of the company under study to see if the enterprise has enough ability and willingness to gain profit and to grow.

Now, let us apply the notions above in a simplified situation.

Q: If JNJ had a present book value of $50 Billion and annual operational cash flow of $10Billion and the business shuts down after 5 years, how much would you pay for the Co? Would you pay $200 Billion? Why or why not?

Method 1

Let us use the discounted cash flow to analyze the situation.
With rate = 0 %, DCF = 10 +10 + 10 + 10 + 10 = $ 50 Billion.

Since a company's intrinsic value is calculated as the sum of its book value and the present value (PV) of free cash flows, we have the following:

$ 50 Billion of book value + $ 50 Billion of operating cash flow = $ 100 Billion

If one has to pay $ 200 Billion, it would be overvalued by $ 200 Billion – $100 Billion = $ 100 Billion or double the maximum amount of money one would to be paying.

Method 2

Let us use the formula for EV as previously seen (e.g.: EV = EBITDA x Enterprise Multiple).
With all other values set to null, EBITDA = operational cash flow. Hence, since JNJ generates $ 10 Billion each year, let the average EBITDA $_{5\ years}$ = $ 10 Billion. For Enterprise Multiple approximating 12x for JNJ,

$$EV_{JNJ} = \$\ 10\ Billion\ x\ 12 = \$\ 120\ Billion$$

The result shows that paying $ 200 Billion is 40 % more than what one would be willing to pay for the company.