

An Explanation of Amortization, Taxes, and PMI

Amortization. You've no doubt heard the word, but what in the world does it actually mean? Many people falsely assume that amortization is just a fancy word for dividing a loan's value over the repayment period.

In reality, **amortization is simply the elimination of debt as payments are made.** The easiest way to understand how amortization works is to analyze a small amortization schedule. The amortization schedule below is based on a \$1,000 loan at a 5% annual interest rate, paid over 12 months.

Amortization Schedule				
Payment	Balance	Interest	Principal	Total
1	\$1,000	\$4.17	\$81.44	\$85.61
2	\$918.56	\$3.83	\$81.78	\$85.61
3	\$836.77	\$3.49	\$82.12	\$85.61
4	\$754.65	\$3.14	\$82.47	\$85.61
5	\$672.18	\$2.80	\$82.81	\$85.61
6	\$589.38	\$2.46	\$83.15	\$85.61
7	\$506.22	\$2.11	\$83.50	\$85.61
8	\$422.72	\$1.76	\$83.85	\$85.61
9	\$338.87	\$1.41	\$84.20	\$85.61
10	\$254.67	\$1.06	\$84.55	\$85.61
11	\$170.13	\$0.71	\$84.90	\$85.61
12	\$85.22	\$0.36	\$85.25	\$85.61

Payment represents the 12 payment periods for the loan.

Balance refers to the loan's principal balance at the *beginning* of each month.

Interest is the amount of *interest paid for that period*.

Principal is how much the loan balance is paid down during that period.

Total stands for the sum of principal and interest payments for each period.

In the example above, the first month's interest expense is calculated by multiplying the beginning balance of \$1,000 by the period interest rate. The annual interest rate is 5%, so the period interest rate is 5% divided by 12 which equals a bit over .4%. When this is computed, the total comes out to \$4.17.

Math Follow Along $(.05/12) = .00417$ | $\$1,000 \times .00417 = \4.17

Since we know that the loan requires 12 equal payments of \$85.61, the principal portion of the first month's payment can be easily calculated by subtracting \$4.17 from \$85.61. This figure, \$81.44, is then subtracted from the first months balance to show how much principal remains. We can now continue the process by calculating the second month's interest based on the new balance of \$918.56 and follow the same steps as before to complete the table all the way down to \$0!

Math Follow Along $\$85.61 - \$4.17 = \$81.44$ | $\$1,000 - \$81.44 = \$918.56$

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Estimating a monthly mortgage payment requires more than simply looking at the principal, term (length of the mortgage), and the interest rate.

Other primary costs include:

- **Property Taxes**
- **Insurance**
- **Down Payment**
- **Private Mortgage Insurance**

Let's take a quick look at each cost to ensure you understand how to include them.

Taxes and Insurance

It is important to include taxes and insurance when computing the potential costs of a mortgage. After all, they are required costs no matter where you live or what type of home you purchase.

The majority of mortgage calculators assume a flat rate for yearly taxes and insurance costs. Because the actual amounts vary based on location and many other factors, it's reasonable to provide an estimate here.

Property Taxes – **Estimated 1.5% of principal mortgage value**

Insurance – **Estimated 0.5% of principal mortgage value**

Purchase price:	<input type="text" value="250,000"/>	\$
Down payment:	<input type="text" value="10"/>	% (\$25,000)
Mortgage term:	<input type="text" value="30"/>	years
Interest rate:	<input type="text" value="5.5"/>	%
Property tax:	<input type="text" value="3,750"/>	\$ per year
Property insurance:	<input type="text" value="1,250"/>	\$ per year

On a \$250,000 mortgage, these amounts come to \$3,750 in property taxes and \$1,250 in insurance.

Math Follow Along

$$\text{Taxes} \mid \$250,000 \times .015 = \$3,750$$

$$\text{Insurance} \mid \$250,000 \times .005 = \$1,250$$

Many home buyers do not know what to expect on their exact costs for taxes and insurance. Estimating these costs using the suggested percentages helps create a more complete picture of the costs associated with a mortgage. Make it easy for them!

It's also important to note that a more experienced buyer may want to input a set value for taxes and insurance. Keep the option available. Allow for users to manually input a dollar amount for taxes and/or insurance.

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Down Payments and PMI

Two other common expenses to consider when determining a mortgage payment are down payment amount and its effect on private mortgage insurance (PMI).

Most mortgages require a down payment. Depending on the dollar amount provided as a down payment, home buyers can obtain better terms and interest rates on their mortgage.

If the down payment is less than 20% of the principal mortgage amount, it's likely that PMI will be required. PMI is an additional monthly insurance cost added directly to the mortgage payment.

Adding fields for these two values is key to projecting monthly mortgage costs.

Down Payment – **Default this amount to 10%.**

PMI – **Estimated at \$80 per month.**

Purchase price:	<input type="text" value="250,000"/>	\$
Down payment:	<input type="text" value="10"/>	% (\$25,000)
Mortgage term:	<input type="text" value="30"/>	years
Interest rate:	<input type="text" value="5.5"/>	%
Property tax:	<input type="text" value="3,750"/>	\$ per year
Property insurance:	<input type="text" value="1,250"/>	\$ per year
PMI:	<input type="text" value="80"/>	\$

Including this in your calculations is simple. With a default down payment % of 10%, the home buyer is required to pay PMI. As shown here, \$80 should be added to the monthly mortgage payment.

Purchase price:	<input type="text" value="250,000"/>	\$
Down payment:	<input type="text" value="20"/>	% (\$50,000)
Mortgage term:	<input type="text" value="30"/>	years
Interest rate:	<input type="text" value="5.5"/>	%
Property tax:	<input type="text" value="3,000"/>	\$ per year
Property insurance:	<input type="text" value="1,500"/>	\$ per year
PMI:	<input type="text" value="0"/>	\$

If the user changes the default down payment amount to be greater than or equal to 20%, the PMI costs are waived. As shown here, the estimated \$80 should NOT be added to the monthly mortgage payment.

Adding these simple calculations to any mortgage calculator is sure to create a more accurate estimation of a monthly mortgage payment.