Symbols:
P = Principal (the amount of money borrowed or loaned)
i = annual interest rate
\( t = \text{time in relation to one year} \)

Simple interest formula:
\[ \text{Principal} \times \text{annual interest rate} \times \text{time} = \text{interest amount} \]
\[ P \cdot i \cdot t = \text{interest amount} \]

Due date of notes: If the note is expressed in days then count the exact days to determine the due date. If the note is expressed in months count months.

For example:
A 90-day note dated February 1 would be due on May 2\textsuperscript{nd} whereas a 3-month note dated February 1 would be due on May 1\textsuperscript{st}.

Example 1: Assume you borrowed $10,000 from the bank on January 1, 2006 agreeing to pay 7.5% simple interest. All principal and interest are due at the end of three months, which is April 1, 2006.

a. Calculate the amount of accrued interest as of January 31, 2006 and show the adjusting journal entry, which is one month after borrowing the money.

\[ \$10,000 \times 7.5\% \times 1/12 = \$62.50 \]

\[ \begin{align*}
\text{Dr. Interest expense} & \quad \$62.50 \\
\text{Cr. Interest payable} & \quad \$62.50
\end{align*} \]

b. Calculate the total accrued interest as of March 31, 2006.

\[ \$10,000 \times 7.5\% \times 3/12 = \$187.50 \]

c. Calculate the additional accrued interest for February and March and show the adjusting journal entry assuming the adjustment in “a” was made.

\[ \$10,000.00 \times 7.5\% \times 2/12 = \$125.00 \text{ OR } \$187.50 - \$62.50 = \$125.00 \]

\[ \begin{align*}
\text{Dr. Interest expense} & \quad \$125.00 \\
\text{Cr. Interest payable} & \quad \$125.00
\end{align*} \]

d. Record the entry on April 1, 2006 paying off the loan assuming entries “a” and “c” were made.

\[ \begin{align*}
\text{Dr. Note payable} & \quad \$10,000.00 \\
\text{Dr. Interest payable} & \quad \$187.50 \\
\text{Cr. Cash} & \quad \$10,187.50
\end{align*} \]

e. Record the entry on April 1, 2006 paying off the loan assuming no entries were made for the interest since the loan was taken out.

\[ \begin{align*}
\text{Dr. Note payable} & \quad \$10,000.00 \\
\text{Dr. Interest expense} & \quad \$187.50 \\
\text{Cr. Cash} & \quad \$10,187.50
\end{align*} \]
Example 2: Assume you borrowed $5,000 on April 1, 2006 agreeing to make six equal payments of $877.63, including interest at 18% per year, compounded monthly. Calculate the amount of interest and principal that would be included in each of the six payments. Because monthly payments are to be made the interest is also calculated monthly. The interest amount is added to the loan balance, increasing the amount due, and at the same time the payment reduces the loan balance.

Using: \( P \cdot i \cdot t = \text{interest amount} \)

\[
\begin{align*}
\text{Principal paid} & \\
\$ 5,000.00 \times 18\% \times \frac{1}{12} & = 75.00 \text{ interest} \\
+ & \quad \text{75.00} \\
\_ & \quad 877.63 \\
4,197.37 \times 18\% \times \frac{1}{12} & = 62.96 \text{ interest} \\
+ & \quad \text{62.96} \\
\_ & \quad 877.63 \\
3,382.70 \times 18\% \times \frac{1}{12} & = 50.74 \text{ interest} \\
+ & \quad \text{50.74} \\
\_ & \quad 877.63 \\
2,555.81 \times 18\% \times \frac{1}{12} & = 38.34 \text{ interest} \\
+ & \quad \text{38.34} \\
\_ & \quad 877.63 \\
1,716.52 \times 18\% \times \frac{1}{12} & = 25.75 \text{ interest} \\
+ & \quad \text{25.75} \\
\_ & \quad 877.63 \\
864.64 \times 18\% \times \frac{1}{12} & = 12.99 \text{ interest} \\
+ & \quad \text{12.99} \\
\_ & \quad 877.63 \\
0 & = \text{Ending Principal balance} \\
\hline
\text{Principal Paid} & = \$ 5,000.00
\end{align*}
\]

In order to calculate the payment amount for this kind of loan you would use Time Value Money (TVM) concepts and calculations. These are also known as compound interest calculations. For an explanation and examples of compound interest (also known as Time Value of Money – TVM) see the following:

- Time Value Money – Summary of Concepts and Techniques
- Time Value Money – Timeline Visualization and Short Explanations
- Time Value Money – Practice Problems
- Time Value Money – Answer Key to Practice Problems
- TVM Present & Future Value Tables (for solving practice problems)

In this particular case the loan principal ($5,000.00) is the present value of an annuity, where the number of time periods (n) is 6, the monthly interest rate (i) is 1.5%, and the payment (r) is to be determined. Using Excel the formula would be: =PMT(0.015,6,5000). One may also use a Business Financial Analyst calculator or loan amortization software like "TValue5" by Timevalue Software.