Interest Worksheet:

Use your <u>COMPINT</u> program.

COMPINT: Stands for compounded interest. You simply put money in an account in one lump sum and it accrues interest over a period of time. The interest could be compounded monthly, yearly, quarterly, etc.

1) If you put $1000 in the bank that offers 6.75% interest compounded monthly and you plan to leave it in the account for 8 years. How much money will you have in the bank at the end of this time? _____

2) If you put $2500 in the bank that offers 8.23% interest compounded quarterly and you plan to leave it in the account for 4 years. How much money will you have in the bank at the end of this time? _____

3) If you put $2500 in the bank that offers 8.23% interest compounded daily and you plan to leave it in the account for 4 years. How much money will you have in the bank at the end of this time? _____

What is important to understand about Compounded Interest?

Use the <u>MORTGAGE</u> program:

Mortgage: You borrow money from a lender at a certain interest rate and you make monthly payments to the lender for the specified numbers of years.

1) You need to borrow $15,000 to buy a car. The interest rate is 8% for a 5 year loan.

    a) Calculate your monthly payments. _____

    b) How much money do you actually pay back? _____
                    (monthly payments x number of months)

    c) How much money do you pay to interest? _____

2) You need to borrow $400,000 to buy a new home. The interest rate is $7\frac{1}{4}$% for a 30 year loan.

    a) Calculate your monthly payments. _____

    b) How much money do you actually pay back? _____

      c) How much money do you pay to interest? _____

3) You buy a sound system on your credit card for $3000. You plan on paying it back in 3 years and the interest rate on your credit card account is 19.5%.

      a) Calculate your monthly payments. _____

      b) How much money do you actually pay back? _____

      c) How much money do you pay to interest? _____

What is important to understand about Mortgages?

Use your <u>ANNUITY</u> program:

ANNUITY: An annuity is when a set amount of money is put into an account (usually monthly) and it grows with interest over the number of years invested. Retirement accounts are good examples of an annuity.

1) At age 21 when you graduate from college, you decide that instead of smoking you are going to put the money you would spend on cigarettes into an annuity. So you put $25 a month into an annuity that offers 7.43% interest until you retire at age 66.

      a) At 66, how much money would you have in the account? _____

      b) How much money would you have actually put into the account? _____

      c) How much money would your savings have earned? _____

2a) At age 25 you start an annuity. You put $100 a month for 40 years at an interest rate of 9%.
      a) How much money would you have in the account? _____

      b) How much money would you have actually put into the account? _____

      c) How much money would your savings have earned? _____

2b) At age 45 you start an annuity. You put $700 a month for 20 years at an interest rate of 9%.
      a) How much money would you have in the account? _____

      b) How much money would you have actually put into the account? _____

c) How much money would your savings have earned? _____

What is important to understand about an Annuity?

Use your **STILLOWE** program:

STILLOWE: It is the amount of money you still owe a lender after a period of time or series of monthly payments. The way it works is, the lender always takes the interest on the amount of money you owe from the monthly payment and what is left is deducted from the principle or the amount you still owe.
    Example: The first month's interest on the loan below is calculated by taking 1/12 of the interest rate on the amount you owe. $500,000\left(\dfrac{.083}{12}\right) = 3458.33$ which is an interest payment, the rest of your payment goes to principle (which isn't much). Each following month's calculation is the same.

1) On a 30 year loan of $500,000 at 8.3% your monthly payments would be $3773.92 a month.
    a) How much money do your still owe the loan company after 1 monthly payment? _____ How much money did you pay to the bank? _____ How much was taken off your loan? _____
How much money went to interest? _____

    b) How much money do your still owe the loan company after 1 year or 12 monthly payments? _____ How much money did you pay to the bank? _____ How much was taken off your loan? _____
How much money went to interest? _____

    c) How much money do your still owe the loan company after 10 year or 120 monthly payments? _____ How much money did you pay to the bank? _____ How much was taken off your loan? _____
How much money went to interest? _____

What is important to understand about the amount you Still owe on a loan?

Use your **FUTVAL** program:

FUTVAL: Is the reverse of an annuity. If you know the amount of money you will need in the future (your retirement, kids college education, etc), you can calculate the approximate amount of money you will need to put into an account each month. You will have to consider inflation and a guess on the long term interest rates, but it will give you an idea of the amount you need to save. You are also neglecting any taxes on the interest.

Note: Use the **ANNUITY** program to calculate the amount of money you would have in savings after 30 years if the interest rate is 8% and you put $100 into the account every month. You should get $150029.52. Now check this with the **FUTVAL** program. The future value you want is $150029.52 at 8% for 30 years and you should get $100 as monthly payments.

1) You are 22 years old when you start working and hoping to have $1,000,000 in your retirement account when you are 65. Assume the interest rate is fixed at 6%. How much money would you need to put into your retirement account each month.

_____

2) Assume in the problem above, you decide to have a good time when your young and send all you income. You plan to live like this until your 40 years old at which time you will start saving for the $1,000,000 for when your 65, how will you now have to save each month if the interest rate was still 6%.

_____

3) You just had a baby and when your child is 18 you expect college to cost about $400,000 for 4 years of education. If you can get a tax free account at 5.75%, how much money would you need to put into the account each month.

_____

You need to decide which programs to use to solve the following problems:

1) What is the better deal?
        a) $1000 at 7% compounded monthly for 1 year.   _____

OR

        b) $1000 at 7.2% compounded yearly for 1 year.   _____

Explain why:

2) Two twin siblings are 20 years old.
        Sibling A decides to start an annuity and invests $100 a month at 9% for 8 years. Then sibling A stops the annuity and put the lump sum of money earned in the annuity into an account that earns 9% compounded monthly for 37 years or until he is 65 and ready to retire.
        How much money does sibling A have after the first 8 years? _____

        How much money does sibling A have at age 65? _____

        How much money did sibling A actually put into savings? _____

        Sibling B decides at age 28 when sibling A stopped the annuity to start an annuity. Sibling B starts putting $100 a month into an annuity which gives 9% and sibling B does this until ready to retire at age 65 or for 37 years.

        How much money does sibling B have at age 65? _____

        How much money did sibling B actually put into savings? _____

Who had more money at retirement time and explain why?

3) The difference 1% makes.
      a) You borrow $400,000 at 7% for 30 years.
        What are your monthly payments? _____ What is the total amount you pay back to the lender? _____

      b) How much money did you pay to the lender over a 3 year period. _____
How much do you still owe the lender after the 3 years. _____. This means of the money you paid back over the 1st 3 years, how much went to interest _____
and how much went to principle. _____

      c) You borrow $400,000 at 8% for 30 years.
        What are your monthly payments? _____ What is the total amount you pay back to the lender? _____

      d) How much money did you pay to the lender over a 3 year period. _____
How much do you still owe the lender after the 3 years. _____. This means of the money you paid back over the 1st 3 years, how much went to interest _____
and how much went to principle. _____

What difference does 1% make on the above 30 year loan? _____

4) Start saving when your young.
      a) You are 24 years old and would like to retire at 60 years old at which time you hope to have saved $1,000,000. How much money would you need to put into a retirement fund, which earns 6.2% interest, each month to reach your goal?

      b) Assume the same is true for part a except you don't start putting money into a retirement fund until you are 43 years old. How much would you now need to save each month.

5) A college education.
      a) You are married and have a child. You assume college will cost about $200,000 for a four year degree when the child is 18 years old. If you plan to pay the total expense for your child, how much you need to put away each month into an account. Since you will probably need to pay taxes on the interest, you will only see a 4% rate on your savings.