

Real World Math Skills



A Simulated Math Unit

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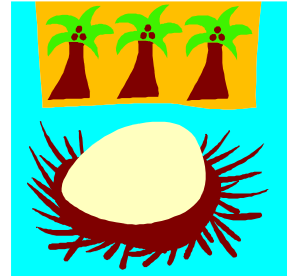
Lesson 12
Planning for Your Retirement

Objective:

Students will learn about planning for their retirement. Students will calculate how much money they should save for their retirement.

Materials:

- Worksheet lesson 12
- Computer with Internet Access and spreadsheet access



Opening Activity:

Have the students guess how much they will need to retire at the age of 60. Write their answers on the board. Have students give explanations for their dollar amount. Go to the website <http://www.calculatormall.com/> or <http://www.calculatormall.com/RetirementPlan.html>. Fill in the appropriate input spaces and explore retirement needs.

So you are living well, paying bills, paying taxes, maybe even saving a few dollars. But, what about retirement? After all you can't work forever. Well, at least you don't want to. So just how much will you need for retirement?

Activity 1: How much you will need in retirement:

Look at the worksheet below. You will want to use your budget to help you figure out the amounts. The numbers in column B will tell you what to type in for a computer spreadsheet.

	A	B
1	1. How much money would you like or do you need each month for expenses when you retire? (In today's dollars.)	
2	2. What is the current inflation rate? You can look up the inflation rate on the internet or historically, since 200 the inflation rate has run about 2.78%.	
3	3. How many years until you retire?	
4	4. Add 1 to the number in problem 2. (Be sure to change the percent to a decimal.)	=1+B2
5	5. Take the answer in problem 4 to the exponential in problem 3. For example if problem 4 was 2 and problem 3 was 10, you would find 2^{10} . Round to the nearest 10,000.	=B4^B3
6	6. Multiply the answer in problem 1 by the answer in problem 5. Round to the nearest dollar. This is how much you need each month when you retire.	=B1*B5
7	7. You want to know how much you need the first year, so multiply the answer in problem 6 by 12.	=B6*12

Example Worksheet

	A	B
1	1. How much money would you like or do you need each month for expenses when you retire? (In today's dollars.)	\$6,000
2	2. What is the current inflation rate? (If it is unusually low or high, you can put 5% here.) You might want to look this amount up on the internet.	0.0278
3	3. How many years until you retire?	15
4	4. Add 1 to the number in problem 2. (Be sure to change the percent to a decimal.)	1.0278
5	5. Take the answer in problem 4 to the exponential in problem 3. For example if problem 4 was 2 and problem 3 was 10, you would find 2^{10} . Round to the nearest 10,000.	1.508791401
6	6. Multiply the answer in problem 1 by the answer in problem 5. Round to the nearest dollar. This is how much you need each month when you retire.	\$ 9,052.75
7	7. You want to know how much you need the first year, so multiply the answer in problem 6 by 12.	\$ 149,682.83

Activity 2: Spreadsheet calculations:

This will tell you how much you need each year that you retire. You can use the spreadsheet on the computer to calculate how much you will need each year.

	A	B	C
1	Year	Inflation Rate	Amount Needed
2	1	0.0278	
3	=A2+1	0.0278	=C2*(1+B3)
4	=A3+1	0.0278	=C3*(1+B4)
5	=A4+1	0.0278	=C4*(1+B5)



Example

Year	Inflation Rate	Amount Needed	Year	Inflation Rate	Amount Needed
1	0.0278	\$ 149,682.83	16	0.0278	\$ 225,840.17
2	0.0278	\$ 153,844.01	17	0.0278	\$ 232,118.52
3	0.0278	\$ 158,120.88	18	0.0278	\$ 238,571.42
4	0.0278	\$ 162,516.64	19	0.0278	\$ 245,203.70
5	0.0278	\$ 167,034.60	20	0.0278	\$ 252,020.37
6	0.0278	\$ 171,678.16	21	0.0278	\$ 259,026.53
7	0.0278	\$ 176,450.81	22	0.0278	\$ 266,227.47
8	0.0278	\$ 181,356.15	23	0.0278	\$ 273,628.59
9	0.0278	\$ 186,397.85	24	0.0278	\$ 281,235.47
10	0.0278	\$ 191,579.71	25	0.0278	\$ 289,053.82
11	0.0278	\$ 196,905.62	26	0.0278	\$ 297,089.51
12	0.0278	\$ 202,379.60	27	0.0278	\$ 305,348.60
13	0.0278	\$ 208,005.75	28	0.0278	\$ 313,837.29
14	0.0278	\$ 213,788.31	29	0.0278	\$ 322,561.97
15	0.0278	\$ 219,731.63	30	0.0278	\$ 331,529.19

Activity 3: Calculating your annuity

Now that you know how much you need each month for retirement. You can now calculate how much you should save for retirement. You can also calculate this on the internet at: The problems in column B represent what you should type in the cells to create a spreadsheet in order to do the calculations for you.

	A	B
1	1. How much do you want to invest each month?	
2	2. What is the annual interest rate on your investment? (Most investments earn about 8% on the average.)	
3	3. Monthly interest rate. Divide the answer in problem 2 by 12.	=B2/12
4	4. How many years before you retire?	
5	5. How many months before you retire? Multiply problem 4 by 12.	=B4*12
6	6. Add 1 to answer in problem 3.	=B3+1
7	7. Find the exponential of problem 6 taken to the power of problem 5. For example is 6 was 1.01 and problem 4 was 10, you would find 1.014.	=B6^B5
8	8. Subtract 1 from the answer in problem 7.	=B7-1
9	9. Multiply the answer in problem 1 by the answer in problem 8.	=B1*B8
10	10. Divide the answer in problem 9 by the answer in problem 3. This is how much your investments will be worth when you retire.	=B9/B3

Example:

1. How much do you want to invest each month?	\$ 1,200.00
2. What is the annual interest rate on your investment? (Most investments earn about 8% on the average.)	8%
3. Monthly interest rate. Divide the answer in problem 2 by 12.	0.0067
4. How many years before you retire?	15
5. How many months before you retire? Multiply problem 4 by 12.	180
6. Add 1 to answer in problem 3.	1.0067
7. Find the exponential of problem 6 taken to the power of problem 5. For example if 6 was 1.01 and problem 4 was 10, you would find 1.014.	3.30692
8. Subtract 1 from the answer in problem 7.	2.30692
9. Multiply the answer in problem 1 by the answer in problem 8.	\$ 9,600.00
10. Divide the answer in problem 9 by the answer in problem 3. This is how much your investments will be worth when you retire.	\$ 1,440,000.00

Closing Activity:

Will you have enough? If not, you will want to figure out how much you do need to invest.

