

## **Authentic Intellectual Work**

**Teacher – Mrs. Houser**

**Subject – Senior Math**

**Grade – 12th**

**Lesson – Applications of Compound Interest**

**IC Essential Skills/Concepts – Essential Skills – Problem Solving**

**Two H.O.T. questions to structure conversations in your classroom – 1. To what other situations can this formula be applied? 2. What might happen if the interest rates change dramatically, either lower or higher?**

**Introduction/Background – Students would already know the compound interest formula and will have practiced using it in general questions.**

**Task – (Can attach)**

**Bring any supporting documents that will assist students in completing this task such as; rubrics, additional handouts, graphic organizers, Viking Pride in writing, etc.**

## Interest Worksheet

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Directions:** Answer the following questions.

1. Farmer Matt is borrowing \$75,500 as an operating loan. The APR on the loan is 6.5%. He plans to pay the loan off in 1 lump sum of interest after 9 months. What will that total principal + interest payment be?
  
2. Ryan's Crop Dusting is taking a loan to buy a used spray plane. The loan for the plane is \$42,000, set at 4% interest and will be paid off in 12 years. The bank wants to save Ryan some money by calculating the interest on a Remaining-Balance basis in case he pays it off early. Ryan's annual payment is assumed to be \$3500 of principal and \$1600 of interest. Make a table of his payments if Ryan were to pay \$5540 in total payments after year 1.

Year	Principal remaining	Interest Rate	Interest payment	Principal Payment	Total Payment
Year 1	\$42000	4%	\$1600	\$3500	\$5100
Year 2	\$38500	4%			\$5540
Year 3		4%			\$5540
Year 4		4%			\$5540
Year 5		4%			\$5540
Year 6		4%			\$5540
Year 7		4%			\$5540
Year 8		4%			\$5540
Year 9		4%			\$5540
Year 10		4%			
Year 11		4%			
Year 12		4%			
<b>Totals:</b>					

3. Dustin and Brian are borrowing money to buy some pastureland. They need \$120,000. The bank is willing to loan them the money for 5% interest using the Add-on method to compute the loan for 30 years. What will the total monthly payments be? And, how much will they end up paying overall for the land?

4. Adam is buying a few grain bins for his farm. The bins will cost \$50,000 to install. Adam only has \$10,000 that he can spend he will have to borrow the rest. The banker agrees to loan the remainder at 11% interest for 15 years. The Interest will be figured with a remaining balance equal principal method. Complete the table. (Clue RB \* interest = yearly interest payment)

Year	Principal remaining	Interest Rate	Interest payment	Principal Payment	Total Payment
Year 1	\$	11%		\$2666.67	
Year 2		11%			
Year 3		11%		\$2670	
Year 4		11%			
Year 5		11%			
Year 6		11%		\$3000	
Year 7		11%			
Year 8		11%			
Year 9		11%		\$5000	
Year 10		11%			
Year 11		11%		\$2750	
Year 12		11%			
Year 13		11%			
Year 14		11%			
Year 15		11%			
Totals					

Directions: Using the tables for future and present value of money find the following compound interest amounts.

5. Daniel and Adam put \$5000 in the bank in 1987. They have been getting 2% interest compounded annually. What will their value be in 2010?
6. Brad took a \$50,000 loan for some breeding heifers. He knew he wouldn't be able to pay back the loan for 3 years so he set it up for no payments for the 1<sup>st</sup> 3 years. The loan is set at 9% and compounded annually for the 1<sup>st</sup> 3 years. How much will he owe at the end of the 3 years?

7. **Cody and Jordan want to save money to buy a stock trailer for their farming partnership. They want the trailer in 5 years. The bank is offering 3% interest on savings compounded annually. Research what the trailer will cost them and then find what amount of money will they need to invest now in order to have the trailer in 5 years?**
  
8. **Anna wants to have \$5,000,000 saved up by the time she is 65. How much money will she have to invest at 7% when she is 18 in order to do that?**
  
9. **Amanda is planning on investing \$1000 every year into a savings account bearing interest. She wants to have \$100,000,000 in 2055. Research the interest rate at a local bank to use in figuring how much will she have to invest initially in 2009 to make this a reality?**
  
10. **At sometime in your future, you will have to borrow money, either to pay for post-secondary school or to buy a big-ticket item.**
  - a. **Research what amount of money you will have to borrow to pay for this and what the average interest rate would be.**
  - b. **Determine the amount of your total bill with interest that you will have to pay back at the end of your schooling or loan period.**
  - c. **Consider if you have a part-time job during this time and can pay a set amount each month before the loan is due, how much will this effect your final amount owed?**