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Pre-Algebra 8: Scattered Plots and Data

April 27 – May 1

Time Allotment: 40 minutes per day

Student Name: _____

Teacher Name: Mrs. Hudson

Melanie.Hudson@GreatHeartsNorthernOaks.org

Zoom on Tuesdays and Thursdays

4th Period … 10AM

5th Period … 11AM

Packet Overview

Date	Objective(s)	Page Number
Monday, April 27	**Lesson 2 Continued:** Be able to calculate and compare the differences between simple and compound interest.	2-3
Tuesday, April 28	**Lesson 3:** Be able to calculate the interest on credit cards, personal loans, and easy access loans and compare the amount repaid to the original.	4-6
Wednesday, April 29	**Lesson 3 Continued:** Be able to calculate the interest on credit cards, personal loans, and easy access loans and compare the amount repaid to the original.	7-8
Thursday, April 30	Review Lessons 1-3. ***Quiz TOMORROW, Friday, May 1st***	9-10
Friday, May 1	***Quiz on Sections 1-3!**	11-12

Additional Notes:

- **Materials:** Printed packet or notebook paper; pencils. **CALCULATORS may be used.**
  - **Note:** If you are using notebook paper, be sure to write the pages and numbers of the material.
  - **Example:** P. 4; #6) _____
- **Quiz on Pages 11-12**
- **Answer Key:** Pages 13-17

Academic Honesty

I certify that I completed this assignment independently in accordance with the GHNO Academy Honor Code.

Student signature:

_____

I certify that my student completed this assignment independently in accordance with the GHNO Academy Honor Code.

Parent signature:

_____

Pre-Algebra Unit: Financial Literacy

Unit Overview: Financial Literacy

Now we will continue to learn about simple and compound interest, the cost of credit, the cost of college, methods of payments, and financial responsibility. All math tasks are important, but ***these topics will be used regularly throughout your life***. The earlier you learn about these and apply them to your life, the better you will be financially!

Let's review these important topics!

$$p\ (principal) = starting\ amount$$
$$I = earned\ interest$$
$$A = \ NEW\ amount$$
$$r = rate\ of\ interest$$

- $Simple\ interest: I = prt$
- $Compound\ interest: A = p(1 + r)^t$

Monday, April 27

Pre-Algebra Unit: Financial Literacy

Lesson 2 Continued: Comparing Simple and Compound Interest

Objective: Be able to calculate and compare the differences between simple and compound interest.

- Welcome back! Turn to the next page for today's work.

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COMPARING SIMPLE AND COMPOUND INTEREST

1. Gwen has saved $3,500 and wants to deposit it into a savings account that earns 4% annual interest for 10 years. Complete the table below to help Gwen compare her earnings in a simple interest account versus a compound interest account.

	FORMULA	INTEREST EARNED	TOTAL VALUE
SIMPLE INTEREST	$I = 3500(0.04)(10)$		
COMPOUND INTEREST	$A = 3500(1+0.04)^{10}$		

Which type of interest will earn more after 10 years, and ~~how much more~~?

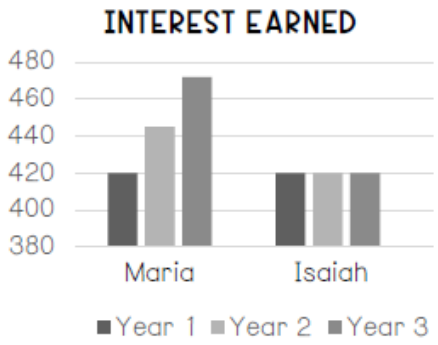
2. Wendy and Connor each deposit $8,300 into accounts that earn 3.5% interest for 25 years. Wendy's account earns annual simple interest and Connor's account earns annual compound interest. Who will earn more interest after 25 years, and how much more interest will they earn?

3. Jack and Carlie each deposit $17,250 into accounts that earn 6% interest for 6.5 years. Jack's account earns annual simple interest and Carlie's account earns annual compound interest. Who will earn more interest after 6 years, and how much more interest will they earn?

4. Which of the following best describes the difference between simple and compound interest?

A. Simple interest is easier to calculate than compound interest.
B. Simple interest earns interest on the previous interest earned only.
C. Compound interest earns interest on the principal plus any previous interest earned.
D. Compound interest earns interest on the principal only.

5. Maria and Isaiah each deposited $7,000 into accounts that earn 6% interest. The graph shows the amount of interest each account earned in the 1st three years. Whose account earns annual simple interest, and whose Account earns annual compound interest? Explain your choice.



- Check those answers!

Tuesday, April 28

Pre-Algebra Unit: Scatter Plots and Data

Lesson 3: Cost of Credit

Objective: Be able to calculate the interest on credit cards, personal loans, and easy access loans and compare the amount repaid to the original.

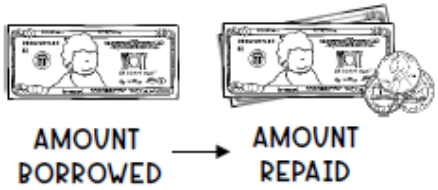
- Be sure not to skip these NOTES!
- It would be helpful for you to read and memorize them.

THE COST OF CREDIT

Credit is money that you borrow, based on the expectation that you will repay the amount in the future, sometimes with added fees and/or interest. Interest associated with credit refers to the charge for the privilege of borrowing money. In the space below, list some common reasons people may use credit:

Answers will vary (buying a home, emergencies, student loans, larger purchases)

It is important to understand that when using credit, you may end up repaying more than you originally borrowed because of interest.



Below are some common forms of credit individuals may use.

CREDIT CARDS	• Issued by a bank or business and typically has a credit limit which sets a maximum amount cardholders can purchase on the card. • A minimum payment is the smallest amount a consumer should pay each month in order to avoid late fees and maintain good credit history. • Interest is charged on any monthly balances that aren't paid off.
PERSONAL LOANS	• Allow a borrower to make larger purchases and usually has a fixed term, or length of time, that the borrower will have to repay the loan.
EASY ACCESS LOANS	• Typically very short-term and high interest loans. They are generally the quickest way to access funds when necessary.

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Use each of the problems below to calculate repayment, or the total cost of paying back a loan.

1. Peter takes out a $26,000 loan in order to buy a new car. He qualifies for a 4.11% interest rate and his loan is a 5-year term with monthly payments of $480.

a. How many months will Peter be making payments for his car? 5yrs x 12months = 60months

b. Use the term and Peter's monthly payments to find the total cost of repayment. $480(60)=

c. Is the total repayment more or less than the original amount Peter borrowed? Explain why.

d. How is interest with credit different than interest with a savings account?

2. Jill paid for a $1,200 vacation by using a credit card with an 18% interest rate. In order to pay the card off in 12 months, Jill will need to make payments of $110.02 each month. Calculate the total cost of repayment as well as the amount of interest Jill will pay.

110.02
x 12 months
1320.24

Total repayment: $1320.24

1320.00

Interest: $120.24

3. Brady has $20,000 in student loans with 3.3% interest that he plans to pay off in 5 years. He will need to make monthly payments of $362.05. Find the total cost of repayment as well as the amount of interest Brady will pay.

Total repayment: _____

Interest: _____

- Be sure to check and correct your work!

Use the problems below to observe how interest rates and loan lengths affect the cost of credit.

4. Donna is applying for a personal loan of $5,000 with a 5-year term to help furnish her new home. The table shows Donna's monthly payments based on the interest rate that she qualifies for. Complete the table to compare the total repayment and interest paid for each rate.

5 years = 60 months

LOAN	RATE	TERM	MONTHLY PAYMENTS	TOTAL REPAYMENT	INTEREST PAID
$5,000	4%	5 years	$92.08 × 60 =	5524.80 − 5000 =	$524.80
$5,000	8%	5 years	$101.38 × 60 =		
$5,000	12%	5 years	$111.22		

What conclusions can you make about the interest rate and the cost of credit?

5. Joseph is taking out a $32,000 loan with 4.2% interest for a new SUV. The table shows Joseph's monthly car payments based on the term of the loan. Complete the table to compare the total repayment and interest paid for each term.

LOAN	RATE	TERM	MONTHLY PAYMENTS	TOTAL REPAYMENT	INTEREST PAID
$32,000	4.2%	1 year	$2,728		
$32,000	4.2%	3 years	$948		
$32,000	4.2%	5 years	$592		

What conclusions can you make about the length of the term and the cost of credit?

Wednesday, April 29

Pre-Algebra Unit: Financial Literacy

Lesson 3 continued: Cost of Credit

Objective: Be able to calculate the interest on credit cards, personal loans, and easy access loans and compare the amount repaid to the original.

- Review yesterday's notes and try these on your own!

THE COST OF CREDIT

Match each term on the left with its correct definition on the right.

_____1. Credit	A. The smallest amount a consumer should pay each month in order to avoid fees and maintain good credit history
_____2. Interest	B. Issued by a bank or company, usually with a credit limit
_____3. Term	C. The charge for the privilege of borrowing money
_____4. Repayment	D. Short-term, high-interest loans
_____5. Minimum payment	E. The act of repaying a loan, including any interest and fees
_____6. Easy access loans	F. The length of a loan
_____7. Credit cards	G. Money borrowed with the expectation of future repayment

Solve each problem about the cost of credit below.

8. Jameson has $4,300 in credit card debt with 14% interest that he wants to pay off in 24 months. He will need to make monthly payments of $206.46 each month. Calculate the total cost of repayment and the interest Jameson will pay. Total repayment: _____ Interest: _____	9. Christina took out a $9,000 personal loan to remodel a portion of her home into an office for her new business. The loan has a 4-year term and a 5% interest rate. If Christina's monthly payments are $207.26, find the total cost of repayment and the interest Christina will pay on her loan. Total repayment: _____ Interest: _____

- Continue the work on the next page.

10. The Jacksons are taking out a $35,000 loan to remodel their home. The tables below show the rates for a 1-year and 5-year loan from two different lenders. Complete each table to calculate the total repayment and interest paid for each loan offer.

LOAN AMOUNT	TERM	RATE	MONTHLY PAYMENTS	TOTAL REPAYMENT	INTEREST PAID
$35,000	1 year	4.99%	$2,996.10		
$35,000	5 years	4.99%	$660.33		

Which term length would result in the lowest total repayment for the Jackson's, and how much lower would it be?

_____

- Do not forget to check your answers and learn from your mistakes!

Thursday, April 30

Pre-Algebra Unit: Financial Literacy

Lesson: Review Lessons 1-3

Objective: Be able to calculate simple and compound interest and the cost of credit.

- Tomorrow there will be a quiz. Be sure to review this week's work!
- Also, the following questions will also help you review for the quiz.

1) Which type of interest is earned only on the principal?	2) Which type of interest is earned on both the principal PLUS any previous interest?
3) What is the equation for SIMPLE INTEREST?	4) What is the equation for COMPOUND INTEREST?
5) Mrs. Hudson wants to calculate the interest she would earn from investing $1000 into and account that earns 5.5% SIMPLE interest for 42 months. Write down her equation?	6) Mrs. Hudson wants to calculate the interest she would earn from investing $1000 into and account that earns 5.5% COMPOUND interest for 42 months. Write down her equation?

7) Doodle, my 17-year-old dog, has $2000 and she plans to invest into an account that earns 6% SIMPLE interest. Assuming she makes no additional deposits or withdrawals, what will be her interest earned and total after 5 years? Interest Amount: _____ Total: _____	8) Buddy, my 4-year-old dog, has $2000 and he plans to invest into an account that earns 6% interest COMPOUNDED annually. Assuming he makes no additional deposits or withdrawals, what will be his interest earned and total after 5 years? Interest Amount: _____ Total: _____
9) Richey invested $5000 into an account that had a SIMPLE interest. ***After*** 12 years, he had $9800 in his account. What was the interest rate on Richey's account?	10) Ronnie invested money into an account that had a COMPOUND interest rate of 8%. ***After*** 12 years, he had $12,590.85 in his account. What was Ronnie's original deposit if he never made additional deposits or withdrawals? How much interest did he earn?

- Check these answers and review some of the homework problems!

Friday, May 1

Pre-Algebra Unit: Financial Literacy

Lesson: Quiz on Lessons 1-3

Objective: Be able to calculate simple and compound interest and the cost of credit.

- The only work today is the QUIZ!!! You need a pencil and a calculator.
- ARE YOU READY? Be sure to show work! Use separate paper if needed.
- NOTE: Some of these questions will be EXTRA CREDIT!

QUIZ: CALCULATING INTEREST AND THE COST OF CREDIT

Answer each question, and be sure to show work when necessary.

1. Which type of interest is earned on both the principal plus any previous interest earned?

   A. Simple interest
   B. Compound interest
   C. Both simple and compound
   D. None of the above

2. Which of the following best describes interest as it relates to credit?

   A. Additional money earned for having an account
   B. The limit for which an individual may use credit
   C. The charge for the privilege of borrowing money
   D. The total amount a borrower must repay a lender for a loan

3. Derrick wants to calculate the interest he would earn from investing $400 into an account that earns 5.5% annual compound interest for 60 months. Which of the following formulas is set up correctly to help him do this?

   A. $A = 400(1 + 5.5)^{60}$
   B. $A = 400(1 + 5.5)^{5}$
   C. $A = 400(1 + .055)^{60}$
   D. $A = 400(1 + .055)^{5}$

4. Roxanne has $3,000 that she plans to invest into an account that earns 7% simple interest. Assuming she makes no additional deposits or withdrawals, how much interest will Roxanne earn after 15 years?

   A. $3,150 B. $6,150 C. $150 D. $5,277.09

5. Salvador inherited $20,000 and he plans to invest it into a savings account that earns 6% interest compounded annually. Assuming he makes no additional deposits or withdrawals, what will be the total value of Salvador's account after 10 years?

   A. $55,816.95 B. $15,816.95 C. $35,816.95 D. $32,000

6. Cynthia has earned $1,000 and wants to put it in a savings account that earns 5% simple interest. Assuming she makes no additional deposits or withdrawals, what will be the total value of Cynthia's account after 48 months?

   A. $2,400 B. $1,200 C. $200 D. $3,400

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

7. Jim and Bill each invest $15,000 into savings accounts that earn 3.5% interest. Jim's account earns simple interest and Bill's account earns compound interest. After 25 years, who will earn more interest and how much more will he earn?

A. Jim will earn $13,125 more in interest.
B. Bill will earn $22,323.67 more in interest.
C. Jim will earn $35,448.67 more in interest.
D. Bill will earn $7,323.67 more in interest.

8. Emma and Paul each invest $2,000 into accounts that earn 6% interest. If Emma's account earns simple interest and Paul's account earns compound interest, which is the value of each person's account after 8 years?

A. Emma - $2,960; Paul - $3,187.70
B. Emma - $960; Paul - $3,187.70
C. Emma - $2,960; Paul - $1,187.70
D. Emma - $960; Paul - $1,187.70

9. Heather purchased a new $1,500 laptop by using a credit card with a 17% interest rate. She will pay off the balance in 2 years by paying monthly payments of $74.16. Calculate Heather's total cost of repayment.

_____

10. Austin qualified for a $30,000 loan with 7.49% interest in order to buy a new ski boat. The term of his loan is 10 years and his monthly payments are $355.95. Find the amount of interest Austin will pay after 10 years.

_____

11. Trey decides to consolidate his debt and qualifies for a personal loan of $10,000 to help pay off his current credit. He qualifies for an interest rate of 4.29% and is choosing between a term of 5 or 10 years.

RATE	TERM	MONTHLY PAYMENTS
4.29%	5 years	$185.48
4.29%	10 years	$102.63

Which term will result in the lowest total repayment, and how much lower will the repayment be?

A. The 5-year term would be $1,128.80 lower.
B. The 5-year term would be $1,186.80 lower.
C. The 10-year term would be $2,315.60 lower.
D. The 10-year term would be $1,186.80 lower.

12. At a local bank, the interest rate on a $3,500 personal loan with a 3-year term depends on a persons credit. A person with excellent credit would qualify for a 6% interest rate while a person with poor credit would qualify for a 20% interest rate.

RATE	TERM	MONTHLY PAYMENTS
6%	3 years	$106.48
20%	3 years	$130.07

After repaying the loan, how much more interest would a person with poor credit pay compared to a person with excellent credit?

A. $4,682.52
B. $3,833.28
C. $849.24
D. Each person would end up paying the same amount.

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ANSWERS

COMPARING SIMPLE AND COMPOUND INTEREST

1. Gwen has saved $3,500 and wants to deposit it into a savings account that earns 4% annual interest for 10 years. Complete the table below to help Gwen compare her earnings in a simple interest account versus a compound interest account.

	FORMULA	INTEREST EARNED	TOTAL VALUE
SIMPLE INTEREST	$I = 3{,}500(.04)(10)$	$1,400	$4,900
COMPOUND INTEREST	$A = 3{,}500(1.04)^{10}$	$1,680.85	$5,180.85

Which type of interest will earn more after 10 years, and how much more?

Compound; $280.85

2. Wendy and Connor each deposit $8,300 into accounts that earn 3.5% interest for 25 years. Wendy's account earns annual simple interest and Connor's account earns annual compound interest. Who will earn more interest after 25 years, and how much more interest will they earn?

Connor; $4,052.43

3. Jack and Carlie each deposit $17,250 into accounts that earn 6% interest for 6.5 years. Jack's account earns annual simple interest and Carlie's account earns annual compound interest. Who will earn more interest after 6 years, and how much more interest will they earn?

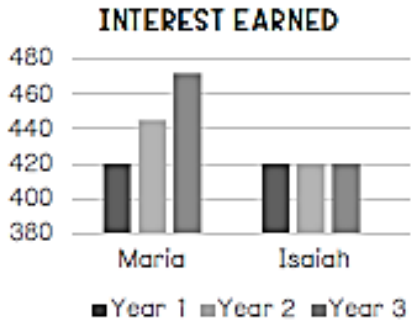
Carlie; $1,215.35

4. Which of the following best describes the difference between simple and compound interest?

A. Simple interest is easier to calculate than compound interest.
B. Simple interest earns interest on the previous interest earned only.
(C.) Compound interest earns interest on the principal plus any previous interest earned.
D. Compound interest earns interest on the principal only.

5. Maria and Isaiah each deposited $7,000 into accounts that earn 6% interest. The graph shows the amount of interest each account earned in the 1st three years. Whose account earns annual simple interest, and whose Account earns annual compound interest? Explain your choice.

Maria earns compound interest because the amount of interest earned each year is continually growing as it is calculated on the principal plus any previous interest earned.



Use each of the problems below to calculate repayment, or the total cost of paying back a loan.

1. Peter takes out a $26,000 loan in order to buy a new car. He qualifies for a 4.11% interest rate and his loan is a 5-year term with monthly payments of $480.

a. How many months will Peter be making payments for his car? 60

b. Use the term and Peter's monthly payments to find the total cost of repayment. 60(480) = 28,800

c. Is the total repayment more or less than the original amount Peter borrowed? Explain why.

Peter paid $2,800 more than the original amount because of added interest.

d. How is interest with credit different than interest with a savings account?

With credit, interest is something that you owe. With savings, interest is something that is earned.

2. Jill paid for a $1,200 vacation by using a credit card with an 18% interest rate. In order to pay the card off in 12 months, Jill will need to make payments of $110.02 each month. Calculate the total cost of repayment as well as the amount of interest Jill will pay.

Total repayment: $1,320.24

Interest: $120.24

3. Brady has $20,000 in student loans with 3.3% interest that he plans to pay off in 5 years. He will need to make monthly payments of $362.05. Find the total cost of repayment as well as the amount of interest Brady will pay.

Total repayment: $21,723

Interest: $1,723

Use the problems below to observe how interest rates and loan lengths affect the cost of credit.

4. Donna is applying for a personal loan of $5,000 with a 5-year term to help furnish her new home. The table shows Donna's monthly payments based on the interest rate that she qualifies for. Complete the table to compare the total repayment and interest paid for each rate.

LOAN	RATE	TERM	MONTHLY PAYMENTS	TOTAL REPAYMENT	INTEREST PAID
$5,000	4%	5 years	$92.08	$5,524.80	$524.80
$5,000	8%	5 years	$101.38	$6,082.80	$1,082.80
$5,000	12%	5 years	$111.22	$6,673.20	$1,673.20

What conclusions can you make about the interest rate and the cost of credit?

The higher the interest rate, the higher the amount of total repayment.

5. Joseph is taking out a $32,000 loan with 4.2% interest for a new SUV. The table shows Joseph's monthly car payments based on the term of the loan. Complete the table to compare the total repayment and interest paid for each term.

LOAN	RATE	TERM	MONTHLY PAYMENTS	TOTAL REPAYMENT	INTEREST PAID
$32,000	4.2%	1 year	$2,728	$32,736	$736
$32,000	4.2%	3 years	$948	$34,128	$2,128
$32,000	4.2%	5 years	$592	$35,520	$3,520

What conclusions can you make about the length of the term and the cost of credit?

The longer the term, the higher the amount of total repayment.

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THE COST OF CREDIT

Match each term on the left with its correct definition on the right.

G 1. Credit	A. The smallest amount a consumer should pay each month in order to avoid fees and maintain good credit history
C 2. Interest	B. Issued by a bank or company, usually with a credit limit
F 3. Term	C. The charge for the privilege of borrowing money
E 4. Repayment	D. Short-term, high-interest loans
A 5. Minimum payment	E. The act of repaying a loan, including any interest and fees
D 6. Easy access loans	F. The length of a loan
B 7. Credit cards	G. Money borrowed with the expectation of future repayment

Solve each problem about the cost of credit below.

8. Jameson has $4,300 in credit card debt with 14% interest that he wants to pay off in 24 months. He will need to make monthly payments of $206.46 each month. Calculate the total cost of repayment and the interest Jameson will pay.

Total repayment: $4,955.04

Interest: $655.04

9. Christina took out a $9,000 personal loan to remodel a portion of her home into an office for her new business. The loan has a 4-year term and a 5% interest rate. If Christina's monthly payments are $207.26, find the total cost of repayment and the interest Christina will pay on her loan.

Total repayment: $9,948.48

Interest: $948.48

10. The Jacksons are taking out a $35,000 loan to remodel their home. The tables below show the rates for a 1-year and 5-year loan from two different lenders. Complete each table to calculate the total repayment and interest paid for each loan offer.

LOAN AMOUNT	TERM	RATE	MONTHLY PAYMENTS	TOTAL REPAYMENT	INTEREST PAID
$35,000	1 year	4.99%	$2,996.10	$35,953.20	$953.20
$35,000	5 years	4.99%	$660.33	$39,619.80	$4,619.80

Which term length would result in the lowest total repayment for the Jackson's, and how much lower would it be?

1-year term; $3,666.60

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1) Which type of interest is earned only on the principal? SIMPLE	2) Which type of interest is earned on both the principal PLUS any previous interest? COMPOUND
3) What is the equation for SIMPLE INTEREST? $I = prt$ I – interest p – principal (start) r – rate as a decimal t – time in YEARS	4) What is the equation for COMPOUND INTEREST? $A = P(1+r)^t$ A → Amount AFTER
5) Mrs. Hudson wants to calculate the interest she would earn from investing $1000 into and account that earns 5.5% SIMPLE interest for 42 months. Write down her equation? P = 1000 r = 5.5 ÷ 100 = 0.055 t = 42 MONTHS – NO = 42 ÷ 12 = 3.5 YEARS $I = 1000(0.055)(3.5)$	6) Mrs. Hudson wants to calculate the interest she would earn from investing $1000 into and account that earns 5.5% COMPOUND interest for 42 months. Write down her equation? P = 1000 r = 0.055 t = 3.5 years $A = 1000(1+0.055)^{3.5}$

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7) Doodle, my 17-year-old dog, has $2000 and she plans to invest into an account that earns 6% SIMPLE interest. Assuming she makes no additional deposits or withdrawals, what will be her interest earned and total after 5 years?

$I = prt$
$I = 2000(0.06)(5)$
$I = \$600$
$+2000$

Interest Amount: $600

Total: $2600

8) Buddy, my 4-year-old dog, has $2000 and he plans to invest into an account that earns 6% interest COMPOUNDED annually. Assuming he makes no additional deposits or withdrawals, what will be his interest earned and total after 5 years?

$A = P(1+r)^t$
$A = 2000(1+0.06)^5$
$A = 2000(1.06)^5$
$A = 2000(1.3382\ldots)$
$A = 2676.45$
-2000

Interest Amount: $676.45

Total: $2676.45

Buddy made more!

9) Richey invested $5000 into an account that had a SIMPLE interest. After 12 years, he had $9800 in his account. What was the interest rate on Richey's account?

$I = prt$
$I = 9800 - 5000 = \$4800$
$P = \$5000$
$r = ?$
$t = 12$ years

$4800 = 5000(r)(12)$
$\frac{4800}{60000} = \frac{60000r}{60000}$
$0.08 = r$

So, $r = 8\%$

10) Ronnie invested money into an account that had a COMPOUND interest rate of 8%. After 12 years, he had $12,590.85 in his account. What was Ronnie's original deposit if he never made additional deposits or withdrawals? How much interest did he earn?

$A = P(1+r)^t$
$A = 12,590.85$
$P = ?$
$r = 0.08$
$t = 12$ years

$12590.85 = P(1+0.08)^{12}$
$12590.85 = P(1.08)^{12}$
$12590.85 = P(2.518)$
$\div 2.518 \quad \div 2.518$

About $5000 = P

P

So, he started with $5000
He made 12590.85
$-$ 5000.00
$7590.85 interest

I rounded it off