Pre-Algebra 8: Scattered Plots and Data

April 20 - 24

Time Allotment: 40 minutes per day

Student Name: _____

Teacher Name: Mrs. Hudson

Melanie.Hudson@GreatHeartsNorthernOaks.org

Packet Overview

Date	Objective(s)	Page Number
Monday, April 20	Be able to calculate simple interest earned on the principal (original amount) and calculate the compound interest on the principal plus previous interest.	2-4
Tuesday, April 21	Be able to calculate simple interest earned on the principal (original amount) and calculate the compound interest on the principal plus previous interest.	5-7
Wednesday, April 22	Be able to calculate simple interest earned on the principal (original amount) and calculate the compound interest on the principal plus previous interest. ***Quiz TOMORROW, Thursday, April 23rd***	8-9
Thursday, April 23	***Quiz on Section #1!** Be able to calculate and compare the differences between simple and compound interest.	10 11-12
Friday, April 24	No school	

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 Page 10**
- **Answer Key:** Pages 13-18

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

Over the next few weeks, we will be learning 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!

Monday, April 20

Pre-Algebra Unit: Financial Literacy

Lesson 1: Calculating Interest

Objective: Be able to calculate simple interest earned on the principal (original amount) and calculate the compound interest on the principal plus previous interest.

- Read and memorize the following information:

CALCULATING INTEREST

Preston earns money by mowing lawns in his neighborhood. List some reasons that Preston might want to deposit his earnings into a savings account rather than keep it at home: (answers will vary)
It is more secure in a savings account, and he might be less likely to spend it.

One reason might be that Preston's money could earn interest, or additional money that you earn for keeping your money in a savings account. Interest is earned regularly, such as annually, and is expressed as a rate, or percentage.

SIMPLE INTEREST

Simple interest is interest earned only on the principal, or the original amount deposited in the account.

SIMPLE INTEREST:
$I = prt$

I = Interest — Free money !!
p = principal (initial amount) $$ you started with!
r = rate (expressed as a decimal) % over 100
t = time (expressed in years) You have to plug in years!

Example
You can't use 12 months
You have to change it to 1 year

- Next page!

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- Let's give these a try!

Use the simple interest formula to find the amount of interest earned in 1-3. Then, find the total value of the account assuming that no other deposits or withdrawals were made.

1. A $600 deposit for 30 years at a simple interest rate of 2%.	2. A $4,100 deposit for 72 months at a simple interest rate of 3.4%.	3. A $1,250 deposit for 10 years at a simple interest rate of 5.25%.
$I = prt$ $I = (600)(.02)(30)$ $I = ?$ $I = \$360$ $p = \$600$ $r = \frac{2}{100}$ or .02 $t = 30$ Interest: $360 Total Value: 600 + 360 = $960	$\frac{3.4}{100} = .034 = r$ $\frac{72 \text{ months}}{12 \text{ mo}} = \frac{72}{12} = 6 \text{ years} = t$ $I = 4100(.034)(6) =$ _____ Interest: _____ Total Value: _____	Interest: _____ Total Value: _____

Apply your knowledge of the simple interest formula to solve 4 and 5.

4. Patel made a deposit into an account that earns 5% simple interest. After 10 years Patel had earned $1,500 in interest. How much was Patel's initial deposit? = p	5. Mandy deposited $600 into an account that earns simple interest, and after 4 years the total value of the account was $672. What was the simple interest rate?
$I = prt$ $1500 = p(.05)(10)$ $p = \$$ _____	_____

- Check those answers in the back!

- Now, we will learn about COMPOUND INTEREST!

COMPOUND INTEREST

Compound interest is earned both on the principal plus any previously earned interest. Think of it as "interest on interest".

COMPOUND INTEREST:

$$A = p(1+r)^t$$

- A = Account value (or amount in account)
- p = principal (initial amount)
- r = rate (expressed as a decimal)
- t = time (expressed in years)

Unlike the simple interest formula, notice that the compound interest formula gives you the total value of the account. Explain how you can use this to find the interest earned:
Take the total value and subtract the principal to find the amount of interest earned.

Use the compound interest formula to calculate both the amount of interest earned as well as the total value of the account in 6-9.

6. A $2,400 deposit for 8 years compounded at an annual interest rate of 4.5%. = 0.045 $A = P(1+r)^t$ $A = 2400(1+0.045)^8$ $A = 2400(1.045)^8$ $A = 2400(1.422)$ $A = \$3412.80$ 3412.80 − 2400 Interest: $1012.80 Total Value: $3412.80 can vary if 1.422 is rounded differently	7. A $15,000 deposit for 6 months compounded at an annual interest rate of 7%. $A = P(1+r)^t$ Interest: _____ Total Value: _____
8. A $950 deposit for 18 years compounded at an annual interest rate of 2.21%. Interest: _____ Total Value: _____	9. A $3,000 deposit for 66 months compounded at an annual interest rate of 1.6%. Interest: _____ Total Value: _____

Use your knowledge of the compound interest formula to answer 10 and 11.

10. Kyle made a deposit into an account that earns 6% annual compound interest. After 36 months, the value of the account was $952.81. Find the approximate amount of Kyle's initial deposit into the account. 36mo = 3yrs $A = P(1+r)^t$ $952.81 = P(1+.06)^3$ $952.81 = P(1.06)^3$ $952.81 = P(.91)$ $\div 1.91 \quad \div 1.91$ $P = \$$ _____	11. Aaliyah made a deposit into an account that earns 6% annual compound interest. After 2 years, the value of the account was $11,236. Find the amount of interest that Aaliyah had earned after 2 years. $A = P(1+r)^t$ $11,236 = P(1+0.06)^2$ $11,236 = P(1.06)^2$ $11,236 = P(1.236)$ $\$10,000 = P$ She started with $10,000 but now has $11,236 So, how much did she get for interest? _____
12. If you were to open a savings account, what information would you want to know about the account first?	

- So… ***Compound interest***: $A = p(1+r)^t$ and ***Simple interest***: $I = prt$
- Check your work!

Tuesday, April 21

Pre-Algebra Unit: Financial Literacy

Lesson 1 continued: Calculating Interest

Objective: Be able to calculate simple interest earned on the principal (original amount) and calculate the compound interest on the principal plus previous interest.

Let's review these important topics!

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

- $Simple\ interest: I = prt$
  - This equation gives you the INTEREST earned after t years. SO, to find the new total, you use $p + I = A$.
- $Compound\ interest: A = p(1 + r)^t$
  - This equation gives you the TOTAL amount of money after t years. SO, to find the interest earned, you use $A - p = I$.

Directions:

1) On the next page, READ CAREFULLY!!!
   a. Is SIMPLE interest or COMPOUND interest being used?
   b. Write down the correct equation!
2) Are you asked to find the INTEREST earned (I) or the ENDING BALANCE (A)?
3) Calculate and check your answer!

- Coloring is optional.

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SIMPLE AND COMPOUND INTEREST

Solve each question, assuming that no other deposits or withdrawals were made. Then, find the answer and color each area on the coloring page with the problem number the corresponding color.

1 Find the interest earned: $4,000 for 4 years at 5% annual simple interest	2 Find the interest earned: $15,500 for 7.5 years at 4.2% annual compound interest	3 Find the interest earned: $1,000 for 40 years at 8% annual simple interest	4 Find the interest earned: $26,000 for 36 months at 7.5% annual compound interest
5 Find the ending balance: $2,500 for 25 years at 2.75% annual simple interest	6 Find the ending balance: $30,000 for 5.5 years at 6% annual compound interest	7 Find the ending balance: $13,000 for 8 years at 3.6% annual simple interest	8 Find the ending balance: $1,500 for 22 years at 9% annual compound interest
9 Find the interest earned: $9,900 for 24 months at 7.8% annual simple interest	10 Find the interest earned: $850 for 10 years at 5% annual compound interest	11 Find the interest earned: $11,500 for 3.5 years at 7.25% annual simple interest	12 Find the interest earned: $7,500 for 15 years at 10% annual compound interest
13 Find the ending balance: $19,000 for 6.5 years at 6.8% annual simple interest	14 Find the ending balance: $45,000 for 18 months at 4% annual compound interest	15 Find the ending balance: $3,000 for 30 years 3.5% annual simple interest	16 Find the ending balance: $21,000 for 9 years at 8.8% annual compound interest

RED	YELLOW	PINK	BLUE	LIGHT GREEN	ORANGE	DARK GREEN	PURPLE
$2,918.13	$41,333.63	$44,862.07	$1,544.40	$47,726.82	$9,987.90	$534.56	$3,200
$5,602.78	$27,398	$6,299.72	$800	$16,744	$6,150	$4,218.75	$23,829.36

- Optional, but fun!

SIMPLE AND COMPOUND INTEREST

Solve each problem. Then, find the answer and color each area on the coloring page with the problem number the corresponding color.

Wednesday, April 22

Pre-Algebra Unit: Financial Literacy

Lesson 1 continued: Calculating Interest

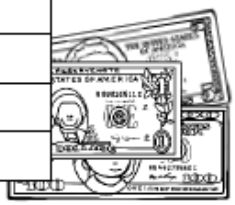
Objective: Be able to calculate simple interest earned on the principal (original amount) and calculate the compound interest on the principal plus previous interest.

- Hopefully, you can now calculate simple and compound interest.
- Today's work is the same, however be sure to plug things into the correct place!
- These questions may have you calculate the interest rate or the original investment (Hint: draw the highway and solve)!

CALCULATING INTEREST

The table lists the interest rates offered on savings accounts at various banks. Use the information in the table to answer questions 1-4.

BANK	RATE	TYPE
VICTORY BANK	3.25%	Simple interest
FINANCIAL LIFE INC.	2.9%	Compound interest
GREEN MARKET GROUP	5%	Simple interest
EXCELLENCE BANK	4.15%	Compound interest



1. Jesse deposits $3,500 in an account at Green Market Group. Find the amount of interest earned and the total value of the account after 15 years. Interest earned: _____ Total Value: _____	2. Donna deposits $850 in an account at Financial Life Inc. Find the amount of interest earned and the total value of the account after 60 months. Interest earned: _____ Total Value: _____
3. Martin deposits $7,000 in an account at Victory Bank. Find the amount of interest earned and the total value of his account after 36 months. Interest earned: _____ Total Value: _____	4. Lillian deposits $1,600 in an account at Excellence Bank. Find the amount of interest earned and the total value of her account after 18 years. Interest earned: _____ Total Value: _____

Use the appropriate interest formula to help you answer 5-7.

5. Jess deposited $5,000 into an account that earns simple interest. After 9 years, Jess had earned $3,150 in interest. What was the interest rate of the account?

_____

6. Kody made a deposit into an account that earns 4% annual compound interest. After 24 months, the value of his account was $2,163.20. What was the amount of Kody's initial deposit?

_____

7. Tiana deposited $500 into an account that earns 6% simple interest. How many years will it take for the value of the account to reach $2,000?

_____

In 8-10, identify and correct the mistake made by each student as they calculated simple or compound interest.

8. Rachel is calculating the interest earned on a deposit of $350 in an account that earns 6% simple interest after 15 years.

$$I = prt$$
$$I = 350(6)(15)$$
$$I = 31{,}500$$

Rachel calculates the interest earned to be $31,500 as shown in her work above. Find and describe the mistake in Rachel's work.

Find the correct amount of interest earned:

_____

9. Keith is calculating the interest earned on a deposit of $2,000 in an account that earns 4.2% annual compound interest after 4 years.

$$A = p(1 + r)^t$$
$$A = 2{,}000(1 + .042)^4$$
$$A = 2{,}357.77$$

Keith determines the interest earned to be $2,357.77 as shown in his work above. Find and describe the mistake in Keith's work.

Find the correct amount of interest earned:

_____

10. Zeke is calculating the interest earned on a deposit of $5,200 in an account that earns 3.15% simple interest after 48 months.

$$I = prt$$
$$I = 5{,}200(.0315)(48)$$
$$I = 7{,}862.4$$

Zeke finds the interest earned to be $7,862.40 as shown in his work above. Find and describe the mistake in Zeke's work:

Find the correct amount of interest earned: _____

Thursday, April 23

Pre-Algebra Unit: Financial Literacy

Lesson 2: Comparing simple and compound interest

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

- First, be sure you are ready to take a QUIZ using SIMPLE and COMOUND interest.
- Then, clear your desk for the quiz.
- You need a sheet of paper (or this page), a pencil, and a calculator.

<table>
<tr><th colspan="2">INTEREST QUIZ…LESSON #1</th></tr>
<tr><td>1) Write the formula for simple interest:</td><td>2) Write the formula for compound interest:</td></tr>
<tr><td colspan="2">Samuel was about to deposit $1,000 into an account for 5 years. He had two different options:</td></tr>
<tr><td>3) One account had 3.5% of simple interest. Calculate the interest and the total.

Interest: $_____

Total: $ _____</td><td>4) The other account had 3% annual compound interest. Calculate the interest and the total.

Interest: $_____

Total: $ _____</td></tr>
<tr><td colspan="2">Which account might be better for Samuel to choose?</td></tr>
<tr><td colspan="2">5) Evelyn made a deposit into an account that earned 5% annual compound interest. After 18 <u>months</u>, the value of the account was $2151.86. Find the approximate value of Evelyn’s initial deposit into the account.</td></tr>
</table>

- Great job!
- Now we are going to compare the differences of simple and compound interest.
- Read and analyze the following problem.

COMPARING SIMPLE AND COMPOUND INTEREST

Adam and Britt each deposit $5,000 into accounts that earn 5% interest. Adam's account earns annual simple interest while Britt's account earns annual compound interest. The tables below show how much interest is earned each year for the first 3 years in Adam and Britt's accounts.

They did one year at a time

ADAM *Annual simple interest*

	CALCULATION	INTEREST
YEAR 1	5,000(.05)	$250
YEAR 2	5,000(.05)	$250
YEAR 3	5,000(.05)	$250
TOTAL INTEREST EARNED:		$750

$I = prt = (5000)(0.05)(3) = 750$

BRITT *Annual compound interest*

	CALCULATION	INTEREST
YEAR 1	5,000(.05)	$250 + 5000 = Yr 2
YEAR 2	5,250(.05)	$262.50 + 5250 = Yr 3
YEAR 3	5,512.50(.05)	$275.63
TOTAL INTEREST EARNED:		$788.13

$A = 5000(1+0.05)^3 = 5788.13 - 5000$

a. Who will earn more interest after three years, and how much more?

b. Using the tables to help, describe any differences you notice between how Adam and Britt's interest amounts are calculated.

Use the following problems to observe how time and interest rates can affect the difference seen between simple and compound interest earned.

1. A deposit of $10,000 is made into an account that earns 6% interest. Use your formulas to complete the table and compare simple and compound interest over various amounts of time.

	SIMPLE INTEREST FORMULA	SIMPLE INTEREST EARNED	COMPOUND INTEREST FORMULA	COMPOUND INTEREST EARNED
5 YEARS	$I = 10,000(.06)(5)$	$3,000	$A = 10,000(1.06)^5$ − 13382.26 − 10,000 =	$3,382.26
15 YEARS				
30 YEARS				

2. For each amount of time, which type of interest consistently earned more? _____

3. Find the difference between the amount of simple and compound interest earned for each amount of time:

5 Years: _____ 15 Years: _____ 30 Years: _____

4. What can you conclude about the effect of time on the difference seen between simple and compound interest?

4. A deposit of $10,000 is made into an account for 15 years. Use your formulas to complete the table and compare simple and compound interest with various interest rates.

	SIMPLE INTEREST FORMULA	SIMPLE INTEREST EARNED	COMPOUND INTEREST FORMULA	COMPOUND INTEREST EARNED
1%	$I = 10{,}000(.01)(15)$	$1,500	$A = 10{,}000(1.01)^{15}$	$1,609.69
5%				
10%				

5. For each interest rate, which type of interest consistently earned more? _____

6. Find the difference between the amount of simple and compound interest earned for each rate:

1%: _____ 5%: _____ 10%: _____

7. What can you conclude about the effect of the interest rate on the difference seen between simple and compound interest?

Practice comparing simple and compound interest earnings below.

8. Oliver makes deposits into two separate savings accounts:

- Account 1: $5,000; 4% annual simple interest
- Account 2: $5,000; 4% annual compound interest

Assuming he makes no additional deposits or withdrawals, find the interest earned and the total value of each account after 60 months.

Account 1:

Interest:_____

Total value:_____

Account 2:

Interest:_____

Total value:_____

9. Judah is going to deposit $5,000 in an account that earns 4% interest for 20 years. How much more interest will he earn if the account earns annual compound interest rather than annual simple interest?

_____

10. Adrienne is going to deposit $8,500 in an account that earns 2.5% interest for 360 months. How much more interest will she earn if the account earns annual compound interest rather than annual simple interest?

_____

- CHECK YOUR ANSWERS!!!
- Friday, April 24… NO SCHOOL!!!

ANSWERS

Use the simple interest formula to find the amount of interest earned in 1-3. Then, find the total value of the account assuming that no other deposits or withdrawals were made.

1. A $600 deposit for 30 years at a simple interest rate of 2%.	2. A $4,100 deposit for 72 months at a simple interest rate of 3.4%.	3. A $1,250 deposit for 10 years at a simple interest rate of 5.25%.
Interest: $360 Total Value: $960	Interest: $836.40 Total Value: $4,936.40	Interest: $656.25 Total Value: $1,906.25

Apply your knowledge of the simple interest formula to solve 4 and 5.

4. Patel made a deposit into an account that earns 5% simple interest. After 10 years, Patel had earned $1,500 in interest. How much was Patel's initial deposit?	5. Mandy deposited $600 into an account that earns simple interest, and after 4 years the total value of the account was $672. What was the simple interest rate?
$3,000	3%

Use the compound interest formula to calculate both the amount of interest earned as well as the total value of the account in 6-9.

6. A $2,400 deposit for 8 years compounded at an annual interest rate of 4.5%.	7. A $15,000 deposit for 6 months compounded at an annual interest rate of 7%.
Interest: $1,013.04 Total Value: $3,413.04	Interest: $516.12 Total Value: $15,516.12
8. A $950 deposit for 18 years compounded at an annual interest rate of 2.21%.	**9. A $3,000 deposit for 66 months compounded at an annual interest rate of 1.6%.**
Interest: $458.01 Total Value: $1,408.01	Interest: $273.68 Total Value: $3,273.68

Use your knowledge of the compound interest formula to answer 10 and 11.

10. Kyle made a deposit into an account that earns 6% annual compound interest. After 36 months, the value of the account was $952.81. Find the approximate amount of Kyle's initial deposit into the account.	11. Aaliyah made a deposit into an account that earns 6% annual compound interest. After 2 years, the value of the account was $11,236. Find the amount of interest that Aaliyah had earned after 2 years.
$800	$1,236

12. If you were to open a savings account, what information would you want to know about the account first? What type of interest it earns, how often the interest is calculated, and what the rate of interest is.

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SIMPLE AND COMPOUND INTEREST

Solve each question, assuming that no other deposits or withdrawals were made. Then, find the answer and color each area on the coloring page with the problem number the corresponding color.

1 Find the interest earned: $4,000 for 4 years at 5% annual simple interest $800	**2** Find the interest earned: $15,500 for 7.5 years at 4.2% annual compound interest $5,602.78	**3** Find the interest earned: $1,000 for 40 years at 8% annual simple interest $3,200	**4** Find the interest earned: $26,000 for 36 months at 7.5% annual compound interest $6,299.72
5 Find the ending balance: $2,500 for 25 years at 2.75% annual simple interest $4,218.75	**6** Find the ending balance: $30,000 for 5.5 years at 6% annual compound interest $41,333.63	**7** Find the ending balance: $13,000 for 8 years at 3.6% annual simple interest $16,744	**8** Find the ending balance: $1,500 for 22 years at 9% annual compound interest $9,987.90
9 Find the interest earned: $9,900 for 24 months at 7.8% annual simple interest $1,544.40	**10** Find the interest earned: $850 for 10 years at 5% annual compound interest $534.56	**11** Find the interest earned: $11,500 for 3.5 years at 7.25% annual simple interest $2,918.13	**12** Find the interest earned: $7,500 for 15 years at 10% annual compound interest $23,829.36
13 Find the ending balance: $19,000 for 6.5 years at 6.8% annual simple interest $27,398	**14** Find the ending balance: $45,000 for 18 months at 4% annual compound interest $47,726.82	**15** Find the ending balance: $3,000 for 30 years 3.5% annual simple interest $6,150	**16** Find the ending balance: $21,000 for 9 years at 8.8% annual compound interest $44,862.07

RED	YELLOW	PINK	BLUE	LIGHT GREEN	ORANGE	DARK GREEN	PURPLE
#11	#6	#16	#9	#14	#8	#10	#3
#2	#13	#4	#1	#7	#15	#5	#12

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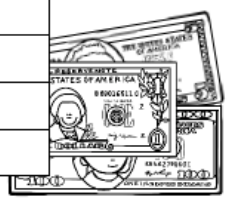
BANK	RATE	TYPE
VICTORY BANK	3.25%	Simple interest
FINANCIAL LIFE INC.	2.9%	Compound interest
GREEN MARKET GROUP	5%	Simple interest
EXCELLENCE BANK	4.15%	Compound interest



1. Jesse deposits $3,500 in an account at Green Market Group. Find the amount of interest earned and the total value of the account after 15 years.

Interest earned: $2,625

Total Value: $6,125

2. Donna deposits $850 in an account at Financial Life Inc. Find the amount of interest earned and the total value of the account after 60 months.

Interest earned: $130.61

Total Value: $980.61

3. Martin deposits $7,000 in an account at Victory Bank. Find the amount of interest earned and the total value of his account after 36 months.

Interest earned: $682.50

Total Value: $7,682.50

4. Lillian deposits $1,600 in an account at Excellence Bank. Find the amount of interest earned and the total value of her account after 18 years.

Interest earned: $1,726.50

Total Value: $3,326.50

Use the appropriate interest formula to help you answer 5-7.

5. Jess deposited $5,000 into an account that earns simple interest. After 9 years, Jess had earned $3,150 in interest. What was the interest rate of the account?

7%

6. Kody made a deposit into an account that earns 4% annual compound interest. After 24 months, the value of his account was $2,163.20. What was the amount of Kody's initial deposit?

$2,000

7. Tiana deposited $500 into an account that earns 6% simple interest. How many years will it take for the value of the account to reach $2,000?

50 years

In 8-10, identify and correct the mistake made by each student as they calculated simple or compound interest.

8. Rachel is calculating the interest earned on a deposit of $350 in an account that earns 6% simple interest after 15 years.

$$I = prt$$
$$I = 350(6)(15)$$
$$I = 31{,}500$$

Rachel calculates the interest earned to be $31,500 as shown in her work above. Find and describe the mistake in Rachel's work.

Rachel did not represent the rate as a decimal; 6 should be .06.

Find the correct amount of interest earned:

$315

9. Keith is calculating the interest earned on a deposit of $2,000 in an account that earns 4.2% annual compound interest after 4 years.

$$A = p(1 + r)^t$$
$$A = 2{,}000(1 + .042)^4$$
$$A = 2{,}357.77$$

Keith determines the interest earned to be $2,357.77 as shown in his work above. Find and describe the mistake in Keith's work.

Keith found the total value of the account. He needs to subtract the principal to find the interest earned.

Find the correct amount of interest earned:

$357.77

10. Zeke is calculating the interest earned on a deposit of $5,200 in an account that earns 3.15% simple interest after 48 months.

$$I = prt$$
$$I = 5{,}200(.0315)(48)$$
$$I = 7{,}862.4$$

Zeke finds the interest earned to be $7,862.40 as shown in his work above. Find and describe the mistake in Zeke's work:

Zeke did not represent the time in years; 48 should be 4.

Find the correct amount of interest earned: $655.20

COMPARING SIMPLE AND COMPOUND INTEREST

Adam and Britt each deposit $5,000 into accounts that earn 5% interest. Adam's account earns annual simple interest while Britt's account earns annual compound interest. The tables below show how much interest is earned each year for the first 3 years in Adam and Britt's accounts.

ADAM — *Annual simple interest*

	CALCULATION	INTEREST
YEAR 1	5,000(.05)	$250
YEAR 2	5,000(.05)	$250
YEAR 3	5,000(.05)	$250
TOTAL INTEREST EARNED:		$750

BRITT — *Annual compound interest*

	CALCULATION	INTEREST
YEAR 1	5,000(.05)	$250
YEAR 2	5,250(.05)	$262.50
YEAR 3	5,512.50(.05)	$275.63
TOTAL INTEREST EARNED:		$788.13

a. Who will earn more interest after three years, and how much more? Britt; $38.13

b. Using the tables to help, describe any differences you notice between how Adam and Britt's interest amounts are calculated. Adam's interest is calculated on the same principal amount each year. The amount that Britt's is calculated on keeps growing, because it adds the interest earned from the previous year.

Use the following problems to observe how time and interest rates can affect the difference seen between simple and compound interest earned.

1. A deposit of $10,000 is made into an account that earns 6% interest. Use your formulas to complete the table and compare simple and compound interest over various amounts of time.

	SIMPLE INTEREST FORMULA	SIMPLE INTEREST EARNED	COMPOUND INTEREST FORMULA	COMPOUND INTEREST EARNED
5 YEARS	$I = 10{,}000(.06)(5)$	$3,000	$A = 10{,}000(1.06)^{5}$	$3,382.26
15 YEARS	$I = 10{,}000(.06)(15)$	$9,000	$A = 10{,}000(1.06)^{15}$	$13,965.58
30 YEARS	$I = 10{,}000(.06)(30)$	$18,000	$A = 10{,}000(1.06)^{30}$	$47,434.91

2. For each amount of time, which type of interest consistently earned more? Compound

3. Find the difference between the amount of simple and compound interest earned for each amount of time:

5 Years: $382.26 15 Years: $4,965.58 30 Years: $29,434.91

4. What can you conclude about the effect of time on the difference seen between simple and compound interest? The longer the time, the more difference you see between simple and compound interest earned.

4. A deposit of $10,000 is made into an account for 15 years. Use your formulas to complete the table and compare simple and compound interest with various interest rates.

	SIMPLE INTEREST FORMULA	SIMPLE INTEREST EARNED	COMPOUND INTEREST FORMULA	COMPOUND INTEREST EARNED
1%	$I = 10{,}000(.01)(15)$	$1,500	$A = 10{,}000(1.01)^{15}$	$1,609.69
5%	$I = 10{,}000(.05)(15)$	$7,500	$A = 10{,}000(1.05)^{15}$	$10,789.28
10%	$I = 10{,}000(.10)(15)$	$15,000	$A = 10{,}000(1.10)^{15}$	$31,772.48

5. For each interest rate, which type of interest consistently earned more? Compound

6. Find the difference between the amount of simple and compound interest earned for each rate:

1%: $109.69 5%: $3,289.28 10%: $16,772.48

7. What can you conclude about the effect of the interest rate on the difference seen between simple and compound interest? The higher the interest rate, the greater the difference you'll see between simple and compound interest earnings.

Practice comparing simple and compound interest earnings below.

8. Oliver makes deposits into two separate savings accounts:

- Account 1: $5,000; 4% annual simple interest
- Account 2: $5,000; 4% annual compound interest

Assuming he makes no additional deposits or withdrawals, find the interest earned and the total value of each account after 60 months.

Account 1:
Interest: $1,000
Total value: $6,000

Account 2:
Interest: $1,083.26
Total value: $6,083.26

9. Judah is going to deposit $5,000 in an account that earns 4% interest for 20 years. How much more interest will he earn if the account earns annual compound interest rather than annual simple interest?

$1,955.62

10. Adrienne is going to deposit $8,500 in an account that earns 2.5% interest for 360 months. How much more interest will she earn if the account earns annual compound interest rather than annual simple interest?

$2954.32