Lesson Description

This lesson focuses on comparing simple interest and compound interest. Students discover the differences between simple and compound interest by creating a 5-year chart using both methods. An Interactive Booklet is used to help understand vocabulary. Students complete a chart for simple and compound interest and calculate the total interest earned for each method. The charts are glued into the Interactive Booklet as examples.

Students are divided into 6 groups in which each group will be given a unique scenario with different amounts for the principal. The groups calculate earnings from simple and compound interest over a 5-year period. Groups transfer this information onto chart paper and participate in a Gallery Walk to compare their results with results of the other groups.

Texas Essential Knowledge and Skills (Target standards)

PFL Math 7.13E calculate and compare simple interest and compound interest earnings

Texas Essential Knowledge and Skills (Prerequisite standards)

- **Math 7.1:** Mathematical Process Standards
- **Math 7.3A:** add, subtract, multiply, and divide rational numbers fluently
- **Math 7.3B:** apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers
- **Math 7.4D:** solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems

National Standards (Supporting standards)

CEE - Council for Economic Education

CCSS - Common Core State Standards

- **CEE Savings 8.5:** Principal is the initial amount of money upon which interest is paid.
- **CEE Savings 8.6:** Compound interest is the interest that is earned not only on the principal but also on the interest already earned.
- **CEE Savings 8.7:** The value of a person's savings in the future is determined by the amount saved and the interest rate. The earlier people begin to save, the more savings they will be able to accumulate, all other things equal, as a result of the power of compound interest.

- **CCSS Math:** Standards for Mathematical Practices
- **CCSS Math 7.RP:** Use proportional relationships to solve percent problems
- **CCSS Math 7.NS:** Apply properties of operations as strategies to add and subtract rational numbers
- **CCSS Math 7.NS:** Apply properties of operations as strategies to multiply and divide rational numbers
- **CCSS Math 7.NS:** Solve real-world and mathematical problems involving the four operations with rational numbers

PFL Terms

- Principal
- Interest
- Rate of interest
- Compound interest
- Simple interest

Time Required

Two 45-minute class period

Materials Required

- A copy of **Visual 7.5-1a**, **7.5-1b** and **7.5-1c**
- A copy of **Activity 7.5-1** for each student
- Copies of **Activity 7.5-2a** (enough for 1/6 of the class), **Activity 7.5-2b** (enough for 1/6 of the class), **7.5-2c** (enough for 1/6 of the class), **7.5-2d** (enough for 1/6 of the class), **7.5-2e** (enough for 1/6 of the class), and **7.5-2f** (enough for 1/6 of the class)
- Calculator for each student
- 2 Blank sheets of paper per student
- Tape or glue
- 1 pair of scissors for each pair of students
- Stapler
- 6 sheets of Chart paper
- Markers

Procedure

Engage

1. Display **Visual 7.5-1a**. Explain to the students that we are going to discuss various savings plans. First, they will take this quick self-assessment to see what they know about saving options. Ask students to answer the questions on the visual to the best of their knowledge. Then, have them explain their answers with a partner. Direct students to make any changes needed. Use the questions from the visual to conduct a class discussion.

   a. What are the different savings options offered by banks and credit unions? ***(Sample answers: savings account, Certificate of Deposit (CD), money market)***
   b. What are the advantages of using one of these savings options? ***(Sample answers: keep money safe, earn interest, the temptation to spend the money is lessened)***
   c. What does it mean to "earn interest"? ***(Sample answer: The financial institution pays the saver a small amount each month or each year for keeping his or her money in their institution.)***
   d. What are the current interest rates that financial institutions are paying for their various savings options? ***(Sample answer: 0.1%, 0.4%, 1.6%)***

Explain

2. Write these statistics on the board: 1975 – 10.75%, 1980 – 20%, 1995 – 9%, 2005 – 7%, 2007 – 7.75%. Then explain to students that interest rates for savings accounts are always fluctuating. The annual interest rates listed on the board are the highest interest rates paid for the given year. The determination of the interest rates is influenced by the Federal Reserve. This is the central bank of the United States. Top employees of the Federal Reserve are constantly studying the economy and analyzing data such as unemployment. They then make recommendations, such as interest rates, in an attempt

to stimulate the economy. No one knows when current interest rates will begin to increase. For today's lesson we will learn how interest rates are calculated for savings accounts. We will use different interest rates to better understand the impact these have on savings accounts.

3. Have students create an interactive booklet. Provide two sheets of paper to each student. Instruct students to fold the paper in half along the shorter line of symmetry and staple on the fold. Have students title the cover *Simple and Compound Interest*, include their name and decorate if time allows. The teacher models each step of the way.

4. Instruct students to orient the book so the fold is on top. Pages will be opened from bottom to top. Number the inside pages 1-6. Have them title the pages as follows: page 1 - Principal, page 2 - Interest, bottom half of page 2 - Annual Rate of Interest, page 3 - Simple Interest, and page 5 - Compound Interest. Leave pages 4 and 6 blank. These pages will be reserved for charts (see steps 6-10). A sample is provided as **Visual 7.5-1c** for clarification; however, do not share the visual with students until vocabulary words have been discussed.

5. Display **Visual 7.5-1b.** Discuss the definitions. Then have students write the definitions in their interactive booklet.

Explore

6. Divide the class into pairs and distribute **Activity 7.5-1** and one calculator to each student. Have students read the directions. Explain that the class will work the first two rows on each table together.

7. Use the explanation below to help students understand how to complete each row of the Simple Interest table. Model two rows for students. Then instruct them to complete the remaining rows independently or with a partner.

    a. Column 1 represents the number of years after the initial deposit of the principal.

    a. Column 2 is the amount to earn interest.

    b. Column 3 is the interest rate. In real-life, interest rates for savings account fluctuate. For our purpose, the interest rate will remain the same.

    c. Column 4 represents the interest earned. Multiply the value in column 2 times the value of column 3. (For row 1, this will be $100 x 0.05 = $5) Explain that the interest earned is transferred to a non-interest earning account.

    d. Column 5 is the ending balance that will earn interest. Enter the principal.

    e. The value of column 5 will be carried over to column 2 of the next row.

8. Once students have completed the first table, model the first two rows of the Compound Interest chart. Use the explanation below to help students understand how to complete each row. Then, instruct them to complete the remaining rows independently or with a partner.

a. Column 1 represents the number of years after the initial deposit of the principal.

b. Column 2 is the amount to earn interest. For the first year, this will only be the initial amount deposited, the principal.

c. Column 3 is the annual interest rate. In real-life, interest rates for savings accounts fluctuate. For our purpose, the interest rate will remain the same.

d. Column 4 represents the interest earned. Multiply the value in column 2 times the value of column 3. (For row 1, this will be $100 x 0.05 = $5) Explain to students that they cannot earn a fraction of a cent. Therefore, they should round down to the hundredths place.

e. Column 5 is the ending balance. Find the sum of the value in column 4 and the value in column 2 to get the value of column 5.

f. Compound interest earns interest on the principal and the interest already earned. The value of column 5 will be carried over to column 2 of the next row.

Explain

9. Once students have completed the activity, allow students to share their responses for the last item on the activity. See the key for sample responses.

10. Distribute scissors and tape to students. Instruct them to cut out the simple interest chart and the compound interest chart on **Activity 7.5-1** and tape on pages 4 and 6, respectively of their interactive notebook. Tell students to use the interactive notebook as a reference for the next activity.

Elaborate

11. Divide students into 6 groups. Distribute to each group one of the 6 activity sheets **Activity 7.5-2a** through **Activity 7.5-2f.** Explain to students that each group has an investor that will open two savings accounts. Each savings account will a one-time deposit for the same amount and the same interest rate. However, one will be simple interest and one will be compound interest. The members of each group should work together to complete the two tables.

12. When this is complete, one person from each group will then get one sheet of chart paper and two markers. Each group will post their results on the chart paper. Point out that the directions for this part are explained on the activity sheet.

13. Hang the completed charts around the room. The teacher should label each chart with a number of 1 to 6. Have students take out a blank sheet of paper. Fold it into 6 equal parts. Label each section 1 to 6.

14. Have students count off 1 to 6. Then regroup students by asking them to stand at the chart paper with their number. They should take a pencil and the folded paper with them.

15. Have students participate in a Gallery Walk to compare the different results. As they visit

each chart, they should do two things. 1) Write the difference between the total interest earned on compound interest and simple interest. Record this on the folded paper with the corresponding number. 2) With your group discuss how each set of data are alike and how they are different. Instruct groups to answer the two questions on their paper. The teacher should have the students rotate to the next chart every 2 minutes or a time the teacher determines is appropriate for the class.

Evaluate/End

16. When groups have completed their Gallery Walk and returned to their seats, lead a class discussion of their findings by asking the questions below.

    a) *What determined the amount of interest earned over the 5 year period?* (***Whether you received simple interest or compound interest, interest rate, principal)***

    b) *Which method of interest produced the larger amount of earnings? (**Compound)***

    c) *Which chart had the greatest difference between compound interest earned and simple interest earned? **(The one with a principal of $1800.)** Why is this? **(The more money you invest using compound interest, the more interest that is earned.***

    d) *What would you tell a friend about the difference between simple and compound interest? (**Simple interest earns interest based on principal alone; compound interest earns interest on the principal and on the accrued interest already earned. The interest is also making interest**.)*

Extension

- Have students predict the interest earned for their chart above on both the simple and compound interest for 10 years. Then have students extend their chart and calculate through 10 years. Next have students compare the difference between simple and compound after 5 years and after 10 years.

Visual 7.5-1a

Directions: Answer the following questions on a sheet of paper.

a. What are the different savings options offered by banks and credit unions?

b. What are the advantages of using one of these savings options?

c. What does it mean to "earn interest"?

d. What are the current interest rates that financial institutions are paying for their various savings options?

Visual 7.5-1b

Principal - The principal is the amount of money upon which interest is paid.

Annual Rate of Interest - The percentage an investor will earn on an investment each year.

Interest - For the saver, interest is the price a financial institution pays for using a saver's money and is normally expressed as a percentage of the amount saved.

Simple Interest – The amount of interest earned on the principal only.

Compound Interest – The interest that is earned on the principal and the interest already earned.

Visual 7.5-1c

Simple and Compound Interest

Name

Principal

Principal is the initial amount of money upon which interest is paid. (The amount deposited before interest is earned.)

Page 1

Annual Rate of Interest

The percentage an investor will earn on an investment each year.

Interest

For the saver, interest is the price a financial institution pays for using a saver's money and is normally expressed as a percentage of the amount saved.

Page 2

Simple Interest

Amount of interest earned on the principal only

Page 3

Simple Interest

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$100	5%	$5	$100
2	$100	5%	$5	$100
3	$100	5%	$5	$100
4	$100	5%	$5	$100
5	$100	5%	$5	$100
Total			$25	

Page 4

Compound Interest

Interest that is earned on the principal and the interest already earned

Page 5

Compound Interest (For interest earned round down to the hundredth place.)

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$100	5%	$5	$105
2	$105	5%	$5.25	$110.25
3	$110.25	5%	$5.51	$115.76
4	$115.76	5%	$5.78	$121.54
5	$121.54	5%	$6.07	$127.61
Total			$27.61	

In words, write a comparison of simple interest and compound interest. **Sample response: Simple interest only earns interest on the principal. Compound earns interest on the principal and interest. Therefore compound interest earns more interest.**

Page 6

Activity 7.5-1 Name _____ Class Period _____

Directions: Complete each table with the information provided.

Jessica opened a savings account with a one-time deposit of $100 that will be left in the account for at least 5 years. The savings account will pay 5% simple interest each year. Use the chart below to calculate the amount of interest she will earn in 5 years.

Simple Interest

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1	$100	5%	$5	$100
2	$100	5%		
3		5%		
4		5%		
5		5%		
Total				

Cheyenne opened a savings account with a one-time deposit of $100 that will be left in the account for at least 5 years. The savings account will pay 5% compound annually. Use the chart below to calculate the amount of interest she will earn in 5 years.

Compound Interest (truncate after the hundredth place)

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1	$100	5%	$5	$105
2	$105	5%		
3		5%		
4		5%		
5		5%		
Total				

In words, write a comparison of simple interest and compound interest. _____

_____

_____

Key 7.5-1 Name _____ Class Period _____

Directions: Complete each table with the information provided.

Jessica opened a savings account with a one-time deposit of $100 that will be left in the account for at least 5 years. The savings account will pay 5% simple interest each year. Use the chart below to calculate the amount of interest she will earn in 5 years.

Simple Interest

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1	$100	5%	$5	$100
2	$100	5%	$5	$100
3	$100	5%	$5	$100
4	$100	5%	$5	$100
5	$100	5%	$5	$100
Total			$25	

Cheyenne opened a savings account with a one-time deposit of $100 that will be left in the account for at least 5 years. The savings account will pay 5% compound annually. Use the chart below to calculate the amount of interest she will earn in 5 years.

Compound Interest (For interest earned round down to the hundredth place.)

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1	$100	5%	$5	$105
2	$105	5%	$5.25	$110.25
3	$110.25	5%	$5.51	$115.76
4	$115.76	5%	$5.78	$121.54
5	$121.54	5%	$6.07	$127.61
Total			$27.61	

In words, write a comparison of simple interest and compound interest. **Sample response: Simple interest only earns interest on the principal. Compound earns interest on the principal and interest. Therefore compound interest earns more interest.**

Activity 7.5-2a Name _____ Class Period _____

Directions: Complete each table with the information provided. Then get one chart paper and 2 markers. Draw a line down the center of the chart paper and label one side Simple Interest and one side Compound Interest. Under each heading list the principal, interest rate, and interest earned after 5 years.

Griffin opened two savings accounts with a one-time deposit of $300 in each account. The first savings account will pay 5% simple interest each year. The second one will pay 5% compound annually. Use the charts below to calculate the amount of interest he will earn in 5 year period.

Simple Interest

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Compound Interest (For interest earned round down to the hundredth place.)

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Activity 7.5-2b Name _____ Class Period _____

Directions: Complete each table with the information provided. Then get one chart paper and 2 markers. Draw a line down the center of the chart paper and label one side Simple Interest and one side Compound Interest. Under each heading list the principal, interest rate, and interest earned after 5 years.

Huan opened two savings accounts with a one-time deposit of $600 in each account. The first savings account will pay 5% simple interest each year. The second one will pay 5% compound annually. Use the charts below to calculate the amount of interest he will earn in 5 year period.

Simple Interest

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Compound Interest (For interest earned round down to the hundredth place.)

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Activity 7.5-2c Name _____ Class Period _____

Directions: Complete each table with the information provided. Then get one chart paper and 2 markers. Draw a line down the center of the chart paper and label one side Simple Interest and one side Compound Interest. Under each heading list the principal, interest rate, and interest earned after 5 years.

Betty opened two savings accounts with a one-time deposit of $900 in each account. The first savings account will pay 5% simple interest each year. The second one will pay 5% compound annually. Use the charts below to calculate the amount of interest she will earn in 5 year period.

Simple Interest

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Compound Interest (For interest earned round down to the hundredth place.)

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Activity 7.5-2d Name _____ Class Period _____

Directions: Complete each table with the information provided. Then get one chart paper and 2 markers. Draw a line down the center of the chart paper and label one side Simple Interest and one side Compound Interest. Under each heading list the principal, interest rate, and interest earned after 5 years.

Ella opened two savings accounts with a one-time deposit of $1,200 in each account. The first savings account will pay 5% simple interest each year. The second one will pay 5% compound annually. Use the charts below to calculate the amount of interest she will earn in 5 year period.

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Simple Interest

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Compound Interest (For interest earned round down to the hundredth place.)

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Activity 7.5-2e Name _____ Class Period _____

Directions: Complete each table with the information provided. Then get one chart paper and 2 markers. Draw a line down the center of the chart paper and label one side Simple Interest and one side Compound Interest. Under each heading list the principal, interest rate, and interest earned after 5 years.

Ned opened two savings accounts with a one-time deposit of $1,500 in each account. The first savings account will pay 5% simple interest each year. The second one will pay 5% compound annually. Use the charts below to calculate the amount of interest he will earn in 5 year period.

Simple Interest

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Compound Interest (For interest earned round down to the hundredth place.)

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Activity 7.5-2f Name _____ Class Period _____

Directions: Complete each table with the information provided. Then get one chart paper and 2 markers. Draw a line down the center of the chart paper and label one side Simple Interest and one side Compound Interest. Under each heading list the principal, interest rate, and interest earned after 5 years.

Felipe opened two savings accounts with a one-time deposit of $1,800 in each account. The first savings account will pay 5% simple interest each year. The second one will pay 5% compound annually. Use the charts below to calculate the amount of interest he will earn in 5 year period.

Simple Interest

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Compound Interest (For interest earned round down to the hundredth place.)

1	2	3	4	5
Year	Amount to Earn Interest	Interest Rate	Interest Earned (2) x (3)	Ending Balance
1				
2				
3				
4				
5				
Total				

Key 7.5-2a

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$300	5%	$15	$300
2	$300	5%	$15	$300
3	$300	5%	$15	$300
4	$300	5%	$15	$300
5	$300	5%	$15	$300
Total			$75	

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$300	5%	$15	$315
2	$315	5%	$15.75	$330.75
3	$330.75	5%	$16.53	$347.28
4	$347.28	5%	$17.36	$364.64
5	$364.64	5%	$18.23	$382.87
Total			$82.88	

Key 7.5-2b

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$600	5%	$30	$600
2	$600	5%	$30	$600
3	$600	5%	$30	$600
4	$600	5%	$30	$600
5	$600	5%	$30	$600
Total			$150	

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$600	5%	$30	$630
2	$630	5%	$31.50	$661.50
3	$661.50	5%	$33.07	$694.57
4	$694.57	5%	$34.72	$729.29
5	$729.29	5%	$36.46	$765.75
Total			$165.75	

Key 7.5-2c

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$900	5%	$45	$900
2	$900	5%	$45	$900
3	$900	5%	$45	$900
4	$900	5%	$45	$900
5	$900	5%	$45	$900
Total			$225	

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$900	5%	$45	$945
2	$945	5%	$47.25	$992.25
3	$992.25	5%	$49.61	$1,041.86
4	$1041.86	5%	$52.09	$1,093.95
5	$1093.95	5%	$54.69	$1,148.64
Total			$248.64	

Key 7.5-2d

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$1200	5%	$60	$1,200
2	$1200	5%	$60	$1,200
3	$1200	5%	$60	$1,200
4	$1200	5%	$60	$1,200
5	$1200	5%	$60	$1,200
Total			$300	

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$1200	5%	$60	$1260
2	$1260	5%	$63	$1323
3	$1323	5%	$66.15	$1,389.15
4	$1389.15	5%	$69.45	$1,458.60
5	$1458.60	5%	$72.93	$1,531.53
Total			$331.53	

Key 7.5-2e

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$1,500	5%	$75	$1,500
2	$1,500	5%	$75	$1,500
3	$1,500	5%	$75	$1,500
4	$1,500	5%	$75	$1,500
5	$1,500	5%	$75	$1,500
Total			$375	

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$1500	5%	$75	$1575
2	$1575	5%	$78.75	$1,653.75
3	$1,653.75	5%	$82.68	$1,736.43
4	$1,736.43	5%	$86.82	$1,823.25
5	$1,823.25	5%	$91.16	$1,914.41
Total			$414.41	

Key 7.5-2f

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$1,800	5%	$90	$1,800
2	$1,800	5%	$90	$1,800
3	$1,800	5%	$90	$1,800
4	$1,800	5%	$90	$1,800
5	$1,800	5%	$90	$1,800
Total			$450	

1 Year	2 Amount to Earn Interest	3 Interest Rate	4 Interest Earned (2) x (3)	5 Ending Balance
1	$1,800	5%	$90	$1,890
2	$1,890	5%	$94.50	$1,984.50
3	$1,984.50	5%	$99.22	$2,083.72
4	$2,083.72	5%	$104.18	$2,187.90
5	$2,187.90	5%	$109.39	$2,297.29
Total			$497.29	