

Lesson Description

This lesson has two objectives. The first is to show eighth graders that saving for the future is a reality for them, and not something they have to put off until much later. Students will examine their spending habits and determine how they might be able to save money and calculate an individual savings goal. The students then move to a computer lab where they will learn how to use an online savings calculator. This calculator will calculate the final savings balance when interest is earned. Students will explore various variables such as initial deposit, monthly deposit and length of savings to investigate how the interest grows.

Finally, the students will learn how to calculate interest for both simple and compound interest using a table and a calculator.

Texas Essential Knowledge and Skills (Target standards)

- **PFL Math 8.12C:** explain how small amounts of money invested regularly, including money saved for college and retirement, grow over time
- **PFL Math 8.12D:** calculate and compare simple interest and compound interest earnings

Texas Essential Knowledge and Skills (Prerequisite standards)

- **Math 8.1A:** apply mathematics to problems arising in everyday life, society, and the workplace

National Standards (Supporting standards)

- **CEE Earning Income 8.7:** People often use a portion of their savings to help themselves or their family members build human capital through education or job training.
- **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.
- **CEE Savings 8.8:** Different people save money for different reasons, including large purchases (such as higher education, autos, and homes), retirement, and unexpected events. People's choices about how much to save and for what to save change considerably over the course of their lives and are based on their tastes and preferences.

CEE - Council for Economic Education

PFL Terms

- annual
- simple interest
- compound interest
- initial amount

Time Required

Two 45-minute class periods

Materials Required	A copy of Activity 8.1-1 for each student A copy of Visual 8.1-1 A copy of Activity 8.1-2 for each student A copy of Activity 8.1-3 for each student and one for a visual A computer with Internet capabilities for each student A calculator for each student
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Procedure**Engage**

1. Tell the students that today, we are going to study how money can grow over time. We will examine how saving even a little money can go a long way. The most common reason for students to save is for college or vocational school. Write the following on the board: *Saving for your education is an investment in yourself.* Ask students to think quietly for a minute what that statement means to them. Then ask them to share their thoughts with a neighbor. Allow a few students to respond. (**Sample response: If I save my money for education, then I will earn more money in the future.**) Adults commonly save for emergencies or retirement. For what kind of emergency might someone save? (**Someone might lose his/her job due to layoffs or the economy. Someone might have an accident and not be able to go to work.**)

Explore

2. Distribute **Activity 8.1-1** to each student. Read the directions to the students.
3. Tell students to find the area in column one that says, "How I spend my money".
 - a. In this area, ask students to write down everything they spent money on for the past week. Allow about 2 minutes for thought. If students are struggling with this task, ask the following questions. *Did you buy a school lunch? Did you buy a snack after school? Did you buy an app or a download? Did you buy a soda, water or a candy?*
 - b. Now ask them to circle one item from their list that they could have done without. Next to this item, write the cost for this item.
 - c. Tell the students that in the same area they are to calculate how much that item could potentially cost them if they purchased the item every week for a month. (**Multiply the cost of the item times 4.3 weeks.**) Instruct students to write this value in column 2. Although some may argue that they will not purchase this item every week of the month, this exercise will help them identify their impulsive spending habits. Tell students that with careful planning money spent on unplanned expenses could become a savings vehicle.
4. Tell students to find the area in column one that says, "Trade-offs I can make".
 - a. Tell students that now we are going to determine if there are any other avenues for saving money by making a trade-off. Explain that a trade-off is giving up of one thing for another. For example, one might spend \$5.00 a day buying lunch at school. If that person decides to bring lunch every day, she might be able to save additional money. Her trade-off for buying lunch at school is not having money to save. Her trade-off for

bringing a sack lunch is getting up earlier to make her lunch. Ask students to give additional examples of trade-offs. **(Sample response: If someone spends \$1.00 a day to buy a soda out of the soda machine, his trade-off is the loss of money saved. If he decides to buy a six pack of generic soda from the store, his trade-off is buying a cold, name brand soda out of the machine.)**

- b. Ask them to examine their list again. Are there any trade-offs they would be willing to make to save money? Write this item in the space titled, "Trade-offs I can make". Some of your students may already be making as many sacrifices as possible. Assure these students that it is okay if they do not have any options to make a trade-off.
 - c. Instruct students to write how they will make the trade-off. **(Sample response: Instead of spending \$1.25 each day at school for a snack, I will wait till I get home to eat a snack.)**
 - d. Instruct students to write the amount they believe they could save each week by making this trade-off. In the same area, they are to calculate how much that item could potentially cost them if they purchased the item every week for a month. **(Multiply the cost of the item times 4.3 weeks.)** Instruct students to write this value in column 2.
5. Tell students to find the area in column one that says, "Other sources of income".
- a. Tell students to think of avenues to earn money. Do you earn an allowance for doing chores? Could you do extra chores around the house for money? Could you tutor a younger child? In this space, write your plan for earning money.
 - b. Instruct students to write the amount they believe they could earn each week in this space. Then calculate how much they could save per month if they saved all of their earnings. Instruct students to write this value in column 2.
6. Instruct students to add the values in column 2 and record on the line that reads "Total Monthly Savings". Explain that this is their monthly savings goal. They will now explore how this small amount of money if invested regularly can grow over time. Do not collect this sheet from the students. This is their private savings plan.
- Explain**
7. Take students to a computer lab with Internet capabilities. Distribute **Activity 8.1-2** to each student.
 8. Tell students that some banks and governmental agencies provide Internet tools to help them plan their future. Explain that the tool they will use in this lesson will be a savings calculator at the Bankrate.com website. Instruct them to access the **Simple savings calculator** by following directions on their handout. Direct their attention to the first column on the screen that has a drop down menu for Annual Interest (compounded) with options "monthly", "quarterly", "semiannually", and "annually". Explain that financial institutions figure interest earned on the money in the account in different ways. Some figure interest once a year which is called compounded annually.

If the interest is calculated twice a year, it is called semiannually. If it is figured monthly, then the interest is calculated monthly. The more frequently it is compounded, the more often the interest is deposited into the savings account. For today's purpose, we will only use compounded **annually**.

9. Display **Visual 8.1-1**. Ask students to explain what each heading on the table means. If there is a term with which they are unfamiliar, they should make a note above heading row.
 - a. **Initial Amount** – The amount of money deposited when the account is open.
 - b. **Monthly Deposit** – This is the amount that is deposited every month.
 - c. **Interest Rate** – For the saver, an interest rate is the price a financial institution pays for using a saver's money and is normally expressed as a percentage of the amount saved.
 - d. **Number of Years** – This is the total length of the savings assuming no money has been withdrawn.
 - e. **Financial Savings Balance** – The total of your savings after number of years indicated in column 4 is the financial savings balance.
 - f. **Amount Invested** – The total amount you contributed to the savings account is the amount invested or the principal.
 - g. **Total Interest** – Total interest is how much the bank paid you for lending them money.

Explore

10. Lead the students through the process of entering the information on the first row of the handout into the **Simple savings calculator**. Explain that the term of 5 years was chosen to represent the number of years they have to save before they graduate, if this year is counted. Once the data is entered, click on the "Calculate" button. Explain that a list of values will appear on the bottom of the screen. Each line represents the balance of the savings account after each year. The "Final Savings Balance" represents the amount of money that they will have in the savings account after 5 years. They should enter this value in the fifth column.
11. **Activity 8.1-2** is a self-guided lesson. Direct students to complete all the tables in **Activity 8.1-2** on their own. The teacher should be prepared with the key to answer any questions. For #2, the teacher will need to approve the process for calculating the amount invested and total interest.
12. After the students have filled in all the tables, pair students together. Then have them discuss and answer the questions below each table.
13. Once students have completed **Activity 8.1-2**, ask volunteers to share their answers.
14. Then ask students to look back at the different tables they have completed, and use them to rank the three factors examined in the lesson to conjecture which of them have the greatest effect on growth, and which has the least. To help them understand the task, ask the questions below.

- a. Locate the table under #1. Which of the first 4 columns had values that varied? (**Monthly Deposit**) Circle these words. This is the factor to consider for the first table.
 - b. Locate the table under #7. Which of the first 4 columns had values that varied? (**Initial Deposit**) Circle these words. This is the factor to consider for the second table.
 - c. Locate the table under #13. Which of the first 4 columns had values that varied? (**Number of Years**) Circle these words. This is the factor to consider for the third table.
15. Tell the students to now rank the three factors examined in the lesson to conjecture which of them have the greatest effect on growth, and which has the least. Tell students to be prepared to defend their ranking. After the students have completed this task, allow them time to justify their rankings with their partner. Allow a few students to share their rankings and justifications. Explain that the important point here, though, is that it is not an “either/or” situation. All three factors can be used to maximize results, and students should try to use as many of them as possible. Because the investigations used in the lesson are somewhat limited in scope, do not be surprised if students choose a different rankings than might be expected.
16. Distribute **Activity 8.1-3** and a calculator to each student. Tell them that in the last lesson they were able to see how interest grew over time using an online calculator. But how is compound interest calculated? Why does it begin to grow faster as the years go by and as the balance grows? To better understand compound interest, we will first investigate simple interest.

Elaborate

17. 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 each cycle or year.
 - b. Column 2 is the beginning balance for the cycle.
 - c. Column 3 is the amount deposited.
 - d. Column 4 is the new balance which is the beginning balance of this cycle plus the amount deposited. Add the value in column 2 and the value of column 3 of this row.
 - e. Column 5 is the annual interest rate that this account will earn.
 - f. Column 6 is the interest earned for this cycle. Find the product of the new balance and the interest rate. Multiply the value in column 4 with the value in column 5 of

this row. Explain to students that they cannot earn a fraction of a cent. Therefore, they should round down to the hundredths place.

g. Column 7 is the ending balance that will earn interest. For simple interest, the account will not earn interest on the interest. Record only the principal. Explain that the interest earned is transferred to a non-interest earning account.

h. The value in column 7 should be carried over to column 2 of the next row.

18. Next, 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 each cycle or year.

b. Column 2 is the beginning balance for the cycle.

c. Column 3 is the amount deposited.

d. Column 4 is the new balance which is the beginning balance of this cycle plus the amount deposited. Add the value in column 2 and the value of column 3 of this row.

e. Column 5 is the annual interest rate that this account will earn.

f. Column 6 is the interest earned for this cycle. Find the product of the new balance and the interest rate. Multiply the value in column 4 with the value in column 5 of this row. Explain to students that they cannot earn a fraction of a cent. Therefore, they should round down to the hundredths place.

g. Column 7 is the ending balance that will earn interest. For compound interest, the account will earn interest on the new balance and the interest earned. Therefore, add the value in column 4 and the value in column 6 of this row.

h. The value of column 7 should be carried over to column 2 of the next row.

19. After the students have filled in all the tables, pair students together. Then have them discuss and answer the questions below each table. Then use the key to go over the answers.

End/Evaluate

20. Once students have completed the activity, have students insert the compound interest, $A = P(1 + r)^t$ formula as the heading for column 8. Explain representation of each variable.

- **A** represents value of the investment,
 - **P** represents principal. This the amount of money upon which interest is paid.
 - **r** represents the annual rate of interest
 - **t** represents the number of years the money is invested
21. Since \$100 is invested every year, each row will need to be calculated separately. In other words, the principal changes every year because there is additional money deposited by the investors. Have students recalculate each line using the formula.
22. For closure, ask the questions below.
- a. Other than savings accounts, what other savings plans do financial institutions offer? (***Certificates of Deposit and Money Markets.***) Explain that a Certificate of Deposit has a minimum deposit and a specific length of time for which the money must remain in the account. Money Markets typically have a minimum deposit and restrict the number of withdrawals. Both of these options often pay a higher interest rate than a savings account.
 - b. What is interest earned? (***It is the money the bank or credit union pays the customer for keeping their money in their savings plans.***)
 - c. What is simple interest? (***Simple interest occurs when the account earns interest on the principal only.***)
 - d. What is compound interest? (***Compound interest occurs when you earn interest on the principal and interest already earned.***) Explain to students that many financial institutions actually pay interest compounded monthly. This means that 1/12 of the annual interest is calculated and deposited into accounts each month. This method of compounding interest allows for the interest to grow faster than compounding annually.

Activity 8.1-1

Directions: This activity sheet is to help you devise a savings goal. It will not be collected. Your teacher will explain how to complete the table below.

Spending and Earning	Money to Save Monthly
How I spend my money:	
Trade-offs I can make:	
Sources of income:	
Total Monthly Savings:	

Visual 8.1-1

Initial Amount – The amount of money deposited when the account is open.

Monthly Deposit – This is the amount that is deposited every month.

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

Number of Years – This is the total length of the savings assuming no money has been withdrawn.

Financial Savings Balance – The total of your savings after number of years indicated in column 4 is the financial savings balance.

Amount Invested – The total amount you contributed to the savings account is the amount invested or the principal.

Total Interest – Total interest is how much the bank paid you for lending them money.

Activity 8.1-2

Name _____ Class Period _____

Directions: On your computer, go to www.bankrate.com. Click on calculators located in the center top of the page. Click on the "Savings calculator" located at the bottom left of the calculator list. Then complete the tables and answer the questions below each table.

1. Enter the values you see on each row below in the boxes on *Bankrate.com*. Click on calculate and record the Final Savings Balance in column 5. Use compounded annually for each calculation.

Initial Amount	Monthly Deposit	Interest Rate	Number of Years	Final Savings Balance	Amount Invested	Total Interest
\$25	\$10	4%	5			
\$25	\$25	4%	5			
\$25	\$50	4%	5			
\$25	\$100	4%	5			

2. To help analyze the table, you will need to calculate the last two columns using a calculator. First, explain the process below that you would use to calculate the Amount Invested and the Total Interest. Then check with your teacher. When your teacher approves your process, complete the last two columns.

Amount Invested = _____

Total Interest = _____

3. How much interest was earned when \$10 was deposited monthly for 5 years? _____
4. How much interest was earned when \$100 was deposited monthly for 5 years? _____
5. What is the difference in interest earned for between the two calculations above? _____
6. What do these calculations tell you about the effect of the monthly deposit? _____

7. Now see what happens if you change the initial deposit. Enter the values you see on each row below in the boxes on *Bankrate.com*. Click on calculate and record the Final Savings Balance in column 6. Use compounded annually for each calculation.

Initial Amount	Monthly Deposit	Interest Rate	Number of Years	Final Savings Balance	Amount Invested	Total Interest
\$10	\$25	4%	5			
\$25	\$25	4%	5			
\$50	\$25	4%	5			
\$100	\$25	4%	5			

8. Use a calculator to calculate the last two columns.
9. How much more was invested with a \$100 deposit versus a \$10 deposit? _____
10. How much more interest was earned when the initial deposit increased from \$10 to \$100?

11. What does this number tell you? Why do you think that is the case?

12. Let's consider that you have an initial deposit of \$1000 with a monthly deposit of \$25 for 5 years at 4% interest rate. Predict how much more interest would be earned than having an initial deposit of \$10.
- My prediction: _____
 - Now use the online calculator to calculate the final savings balance for an initial deposit of \$1000: _____ How much interest was earned? _____
 - How much more interest was earned when the initial deposit increased from \$10 to \$1000? _____
 - How did this compare to your prediction? _____

13. Now see what happens if you change how long you save. Enter the values you see on each row below in the boxes on *Bankrate.com*. Click on calculate and record the Final Savings Balance in column 6. Use compounded annually for each calculation.

Initial Amount	Monthly Deposit	Interest Rate	Number of Years	Final Savings Balance	Amount Invested	Total Interest
\$100	\$25	4%	10			
\$100	\$25	4%	20			
\$100	\$25	4%	30			
\$100	\$25	4%	40			

14. Use a calculator to calculate the last two columns.

15. Based on the totals in the last column, what effect does the length of time have on the total money saved? Explain what you found below.

Cut along on dotted line.

16. Now let's see how much money you will have if you invest your monthly savings goal for 5 years. This is for your information only. Cut off this section and keep for your information.

Initial Amount	Monthly Deposit	Interest Rate	Number of Years	Final Savings Balance	Amount Invested	Total Interest
		4%	5			
		4%	10			
		4%	20			
		4%	30			
		4%	40			

Key 8.1-2

Name _____ Class Period _____

Directions: On your computer, go to www.bankrate.com. Click on calculators located in the center top of the page. Click on the "Savings calculator" located at the bottom left of the calculator list. Then complete the tables and answer the questions below each table.

1. Enter the values you see on each row below in the boxes on *Bankrate.com*. Click on calculate and record the Final Savings Balance in column 5. Use compounded annually for each calculation.

Initial Amount	Monthly Deposit	Interest Rate	Number of Years	Final Savings Balance	Amount Invested	Total Interest
\$25	\$10	4%	5	\$692.21	\$625.00	\$67.21
\$25	\$25	4%	5	\$1,684.89	\$1,525.00	\$159.89
\$25	\$50	4%	5	\$3,339.37	\$3,025.00	\$314.37
\$25	\$100	4%	5	\$6,648.32	\$6,025.00	\$623.32

2. To help analyze the table, you will need to calculate the last two columns using a calculator. First, explain the process below that you would use to calculate the Amount Invested and the Total Interest. Then check with your teacher. When your teacher approves your process, complete the last two columns.

Amount Invested = Initial Amount + Monthly Deposit x 60 months

Total Interest = Final Savings Balance – Amount Invested

3. How much interest was earned when \$10 was deposited monthly for 5 years? \$67.21
4. How much interest was earned when \$100 was deposited monthly for 5 years? \$623.32
5. What is the difference in interest earned for between the two calculations above? \$556.11
6. What do these calculations tell you about the effect of the monthly deposit? Sample answers: The more money you save the more interest you will earn. The more money you save the faster your savings will grow.

7. Now see what happens if you change the initial deposit. Enter the values you see on each row below in the boxes on *Bankrate.com*. Click on calculate and record the Final Savings Balance in column 6. Use compounded annually for each calculation.

Initial Amount	Monthly Deposit	Interest Rate	Number of Years	Final Savings Balance	Amount Invested	Total Interest
\$10	\$25	4%	5	\$1,666.64	\$1,510.00	\$156.64
\$25	\$25	4%	5	\$1,684.89	\$1,525.00	\$159.89
\$50	\$25	4%	5	\$1,715.31	\$1,550.00	\$165.31
\$100	\$25	4%	5	\$1,776.14	\$1,600.00	\$176.14

8. Use a calculator to calculate the last two columns.
9. How much more was invested with a \$100 deposit versus a \$10 deposit? \$90
10. How much more interest was earned when the initial deposit increased from \$10 to \$100? \$19.50
11. What does this number tell you? Why do you think that is the case? By increasing the initial deposit by \$90, an additional \$19.50 was earned after 5 years at 4% interest.
12. Let's consider that you have an initial deposit of \$1000 with a monthly deposit of \$25 for 5 years at 4% interest rate. Predict how much more interest would be earned than having an initial deposit of \$10.
- My prediction: Answers will vary.
 - Now use the online calculator to calculate the final savings balance for an initial deposit of \$1000: \$2871.13 How much interest was earned? $2871.13 - (1000 + 25 \times 60) = \371.13
 - How much more interest was earned when the initial deposit increased from \$10 to \$1000? \$214.49
 - How did this compare to your prediction?

13. Now see what happens if you change how long you save. Enter the values you see on each row below in the boxes on *Bankrate.com*. Click on calculate and record the Final Savings Balance in column 6. Use compounded annually for each calculation.

Initial Amount	Monthly Deposit	Interest Rate	Number of Years	Final Savings Balance	Amount Invested	Total Interest
\$100	\$25	4%	10	\$3,815.42	\$3,100.00	\$715.42
\$100	\$25	4%	20	\$9,315.16	\$6,100.00	\$3,215.16
\$100	\$25	4%	30	\$17,456.10	\$9,100.00	\$8,356.10
\$100	\$25	4%	40	\$29,506.70	\$12,100.00	\$17,406.70

14. Use a calculator to calculate the last two columns.

15. Based on the totals in the last column, what effect does the length of time have on the total money saved? Explain what you found below. Sample answer: It is possible to save a lot of money by saving a little bit of money each month. As time increases, the interest begins to grow faster.

Cut along on dotted line.

16. Now let's see how much money you will have if you invest your monthly savings goal for 5 years. This is for your information only. Cut off this section and keep for your information.

Initial Amount	Monthly Deposit	Interest Rate	Number of Years	Final Savings Balance	Amount Invested	Total Interest
		4%	5			
		4%	10			
		4%	20			
		4%	30			
		4%	40			

Activity 8.1-3

Name _____ Class Period _____

Directions: Read account details above each table, complete the tables then answer the questions.

Emma opened a savings account that will pay 5% simple interest each year. Simple interest is the method of earning interest only on the principal. She will deposit \$100 each year. Use the chart below to calculate her balance and the interest she will receive over 6 years.

Simple Interest

1	2	3	4	5	6	7
Deposit Cycle	Beginning Balance for New Cycle	Deposited Amount	New Balance (2) + (3)	Rate of Interest	Interest Earned (4) x (5)	Ending Balance
1	\$0	\$100	\$100	5%	\$5	\$100
2	\$100			5%		
3				5%		
4				5%		
5				5%		
6				5%		
Total						

1. What is the total interest Emma will receive? _____
2. What is the total Emma deposited in her account after 6 years? _____
3. What is her combined total? _____
4. If Emma stops making deposits and makes no withdrawals, how will her account change?

Ethan also opened a savings account that will pay 5% interest compounded annually. He will deposit \$100 each year on his birthday. Compound interest is the method of earning interest on the principal and the interest earned. Use the chart below to calculate his balance and interest earned. When calculating the interest, round down to the hundredths place.

Compounded Interest

1	2	3	4	5	6	7	8
Deposit Cycle	Beginning Balance for New Cycle	Deposited Amount	New Balance (2) + (3)	Rate of Interest	Interest Earned (4) x (5)	Ending Balance (4) + (6)	
1	\$0	\$100	\$100	5%	\$5	\$105	
2	\$105			5%			
3				5%			
4				5%			
5				5%			
6				5%			
Total							

5. What is the total interest Ethan will receive? _____
6. What is the total Ethan deposited in his account after 6 years? _____
7. What is his combined total? _____
8. If Ethan stops making deposits and makes no withdrawals, how will his account change?

9. Explain the differences between Emma's savings plan and Ethan's savings plan.
10. Enter the annual compound interest formula $A = P(1 + r)^t$ as the heading for column 8.
 - A represents value of the investment
 - P represents principal. This the amount of money upon which interest is paid.
 - r represents the annual rate of interest
 - t represents the number of years the money is invested
 Then recalculate each line.

Key 8.1-3

Name _____ Class Period _____

Directions: Read account details above each table, complete the tables then answer the questions.

Emma opened a savings account that will pay 5% simple interest each year. Simple interest is the method of earning interest only on the principal. She will deposit \$100 each year. Use the chart below to calculate her balance and the interest she will receive over 6 years.

Simple Interest

1	2	3	4	5	6	7
Deposit Cycle	Beginning Balance for New Cycle	Deposited Amount	New Balance (2) + (3)	Rate of Interest	Interest Earned (4) x (5)	Ending Balance
1	\$0	\$100	\$100	5%	\$5	\$100
2	\$100	\$100	\$200	5%	\$10	\$200
3	\$200	\$100	\$300	5%	\$15	\$300
4	\$300	\$100	\$400	5%	\$20	\$400
5	\$400	\$100	\$500	5%	\$25	\$500
6	\$500	\$100	\$600	5%	\$30	\$600
Total		\$600			\$105	

1. What is the total interest Emma will receive? \$105
2. What is the total Emma deposited in her account after 6 years? \$600
3. What is her combined total? \$705
4. If Emma stops making deposits and makes no withdrawals, how will her account change?
The account will continue to grow \$30 every year.

Ethan also opened a savings account that will pay 5% interest compound annually. He will deposit \$100 each year on his birthday. Compound interest is the method of earning interest on the principal and the interest earned. Use the chart below to calculate his balance and interest earned. When calculating the interest, round down to the hundredths place.

Compounded Interest

1	2	3	4	5	6	7	8
Deposit Cycle	Beginning Balance for New Cycle	Deposited Amount	New Balance (2) + (3)	Rate of Interest	Interest Earned (4) x (5)	Ending Balance (4) + (6)	$A = P(1 + r)^t$
1	\$0	\$100	\$100	5%	\$5	\$105.00	$A = 100(1 + .05)^1 = 105.00$
2	\$105	\$100	\$205	5%	\$10.25	\$215.25	$A = 205(1 + .05)^1 = 215.25$
3	\$215.25	\$100	\$315.25	5%	\$15.76	\$331.01	$A = 315.25(1 + .05)^1 = 331.01$
4	\$331.01	\$100	\$431.01	5%	\$21.55	\$452.56	$A = 431.01(1 + .05)^1 = 452.56$
5	\$452.56	\$100	\$552.56	5%	\$27.63	\$580.19	$A = 552.56(1 + .05)^1 = 580.19$
6	\$580.19	\$100	\$680.19	5%	\$34.01	\$714.20	$A = 680.19(1 + .05)^1 = 714.20$
Total		\$600			\$114.20		

- What is the total interest Ethan will receive? \$114.20
- What is the total Ethan deposited in his account after 6 years? \$600
- What is his combined total? \$714.20
- If Ethan stops making deposits and makes no withdrawals, how will his account change?
The amount of interest will increase each year.
- Explain the differences between Emma's savings plan and Ethan's savings plan. Emma is only earning interest on the principal because it's simple interest. Ethan is earning interest on the principal and the interest earned. Ethan's account will grow faster than Emma's account.
- Enter the annual compound interest formula $A = P(1 + r)^t$ as the heading for column 8.
 - A represents value of the investment
 - P represents principal. This the amount of money upon which interest is paid.
 - r represents the annual rate of interest
 - t represents the number of years the money is invested

Then recalculate each line using the formula.