

Lesson 1.1.5: The Credit Crunch

Theme: Personal Finance

Specific Objectives

Students will understand that

- quantitative reasoning and math skills can be applied in various contexts.
- creditworthiness affects credit card interest rates and the amount paid by the consumer.
- reading quantitative information requires filtering out unimportant information (introductory level).
- course expectations regarding writing about mathematics in context.

Students will be able to

- recognize common mathematical concepts used in different contexts.
- apply skills and concepts from previous lessons in new contexts.
- identify a complete response to a prompt asking for connections between mathematical concepts and a context.
- write a formula in a spreadsheet.

Problem Situation: Understanding Credit Cards

When you use a credit card, you can pay off the amount you charge each month. If you do not pay the full amount, you are borrowing money from the credit card company. This is called *credit card debt*. Many people in the United States are concerned about the amount of credit card debt both for individuals and for society in general. In this lesson, you will use skills and ideas from previous lessons to think about some issues related to credit cards. You may want to refer back to the previous lessons.

(1) The statements below came from two websites that report predictions about credit card debt in 2010:

- “In 2010, the U.S. census bureau is reporting that U.S. citizens have over \$886 billion in credit card debt and that figure is expected to rise to \$1.177 trillion this year.”¹
- The debt in 2010 is “expected to grow to a projected 1,177 billion dollars.”²

Do these two websites project the same amount of debt? Or did one of the websites make an error? Justify your answer with an explanation.

¹ Retrieved from www.hoffmanbrinker.com/credit-card-debt-statistics.html.

² Retrieved from www.money-zine.com/Financial-Planning/Debt-Consolidation/Credit-Card-Debt-Statistics.

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You will use the following information from the disclosure for Questions 2 and 3.

Annual Percentage Rate (APR) for Purchases	0.00% introductory APR for 6 months from the date of account opening. After that, your APR will be 10.99% to 23.99% based on your creditworthiness. This APR will vary with the market based on the Prime Rate.
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- (2) In the following questions, you will explore how your credit score can affect how much you have to pay in order to borrow money. Juanita and Brian both have a credit card with the terms in the disclosure form given above. They have both had their credit cards for more than 6 months.
- Juanita has good credit and gets the lowest interest rate possible for this card. She is not able to pay off her balance each month, so she pays interest. *Estimate* how much interest Juanita would pay in a year if she maintained an average balance of \$5,000 each month on her card. Explain your estimation strategy.
 - Brian has a very low credit score and has to pay the highest interest rate. He is not able to pay off his balance each month, so he pays interest. *Calculate* how much interest he would pay in a year if he maintained an average balance of \$5,000 each month. Show your calculation.
 - What are some things that might affect your credit score?
- (3) The APR is an *annual rate*, or a rate for a full year. The APR is divided by 12 to calculate the interest for a month. This is called the *periodic rate*.
- What is the periodic rate for Juanita's card? Round to two decimal places.
 - Juanita has a balance of \$982 on her January statement. Which of the following is the best estimate of how much interest she will pay?

Less than a dollar	\$5–\$10	\$10–\$20	More than \$20
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 - Explain your answer to Part (b).

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You will use the following information from the disclosure for Question 4. A *cash advance* is when you use your credit card to get cash instead of using it to make a purchase.

Annual Percentage Rate (APR) for Purchases	After that, your APR will be 10.99% to 23.99% based on your creditworthiness. This APR will vary with the market based on the Prime Rate.
APR for Cash Advances	28.99% . This APR will vary with the market based on the Prime Rate.

- (4) Discuss each of the following statements. Decide if it is a reasonable statement.
- Jeff pays the highest interest rate for purchases. For a cash advance, he would pay \$0.05 more for each dollar he charges to his card.
 - The interest for cash advances is about two-and-a-half times as much as for the lowest rate for purchases.

Brian used a spreadsheet to record his credit card charges for a month.

◇	A	B	C
1	Credit Card Charges for the Month		
2	Gas	\$56.08	
3	Groceries	\$36.72	
4	Restaurant	\$12.82	
5	Movie tickets	\$16.00	
6			
7	Interest paid		
8			

Brian used the following expression to calculate his interest for these charges for one month.

$$\frac{0.2399}{12}(B2 + B3 + B4 + B5)$$

- (5) Which of the following statements best explains what the expression means in terms of the context?
- Brian added his individual charges. Then he divided 0.2399 by 12. Then he multiplied the two numbers.
 - Brian found the interest charge for the month by dividing 0.2399 by 12 and multiplying it by the sum of Column B.
 - Brian added the individual charges to get the total amount charged to the credit card. He found the periodic rate by dividing the APR by 12 months and multiplied the rate by the total charges. This gave the interest charge for the month.

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Making Connections

Record the important mathematical ideas from discussion.

Further Applications

- (1) Refer to Question 6 in the Lesson 1.1.5 OCE. Write an explanation of at least one estimation strategy that could have been used for each correct statement.
- (2) Refer to the expression given in Question 3 of the Lesson 1.1.5 OCE. Why do you do the addition in the numerator before dividing by 12?