

**Verrrry Interesting!**

**Materials:** calculator, spreadsheet software (optional)

Work alone or in a group of two or three.

Every day the mail contains offers for credit cards. Suppose you accept a credit card offer and sign up for a credit card with a \$500 limit, \$15 minimum monthly payments, and a yearly interest rate of 18%. It sounds like an excellent opportunity for you. You decide to purchase a new TV and some stereo equipment, spending the entire \$500. At the end of the month, you receive a statement. You can pay just \$15 and then pay interest on the rest of this "loan." At a rate of \$15 per month, you estimate that you can pay the money back in  $500 \div 15$  or about 33 months. Is it really that simple?

**Procedure for the Activity**

**Step 1** Estimate how long you think it will take to pay off the \$500 by making the minimum payment.

**Step 2** The table below can be used to find the balance due to the credit card company on each statement.

| Statement Number | Amount Due | Minimum Payment | Balance - Minimum Payment | Interest on Remaining Balance ( $18 \div 12 = 1.5\%$ ) | Balance Due |
|------------------|------------|-----------------|---------------------------|--|-------------|
| 1                | 500.00     | 15.00           | 485.00                    | 7.28   | 492.28      |
| 2                | 492.28     | 15.00           | 477.28                    | 7.16   | 484.44      |
| 3                | 484.44     | 15.00           |                           |  |             |
| 4                |            | 15.00           |                           |  |             |
| 5                |            | 15.00           |                           |  |             |
| 6                |            | 15.00           |                           |  |             |

Here is how the values in each column are found.

**Column 2** This is the balance due on each statement. On Statement 1 the balance due is \$500. On Statement 2 the balance due is from Column 6 of the previous statement.

**Column 3** This column shows that the minimum payment each time is \$15.

**Column 4** This column shows the balance due minus the minimum payment. For Statement 1, that is  $\$500 - \$15 = \$485$ .

**Column 5** This column shows the interest owed on the balance in Column 4. For this particular credit card, you are charged interest for the next month on the \$485 balance. Since the interest rate is 18% per year, each month you pay  $\frac{1}{12}$  of the yearly interest rate or  $18\% \div 12 = 1.5\%$ . Written as a decimal, this is 0.015. For Statement 1, the interest on the remaining balance is found by multiplication, so  $485 \cdot 0.015 = 7.275 \approx 7.28$ .

**Column 6** This column shows the new balance that will be due on the next statement. For Statement 1, this is  $\$485.00 + \$7.28 = \$492.28$ .

**Step 3** Copy or print out the table in Step 2 and complete it for the first six statements.

**Step 4** You can continue the table to find when the balance will be \$0, or you can make a simpler table. The Distributive Property can simplify the calculations that you need to make. Let the

balance  $B$  due on the first statement be  $B = 100\% \cdot (500 - 15) + 1.5\%(500 - 15)$ . This can be rewritten in decimal form as  $B = 1 \cdot (500 - 15) + 0.015(500 - 15)$ . Verify that this equation can be used to find that 492.28 will be due on Statement 2.

**Step 5** Use the Distributive Property to simplify the equation  $B = 1 \cdot (500 - 15) + 0.015(500 - 15)$ . Verify that this equation can be used to find that 492.28 will be due on Statement 2.

**Step 6** Each time you make a payment, the balance changes. In the equation  $B = 1 \cdot (500 - 15) + 0.015(500 - 15)$ , the number 500 will change for each statement. Therefore, replace 500 with a variable, say  $a$ . The equation is then  $B = 1 \cdot (a - 15) + 0.015(a - 15)$ . Use the Distributive Property to simplify this equation.

**Step 7** Make a table with fewer columns than in the table in Step 2 to find the balances due from Statement 6 until the balance is paid off. Use the simplified equation in Step 6 to make your calculations easier.

**Step 8** How did your estimate in Step 1 compare to the actual time it took to pay off the \$500?

**Step 9** How much interest was paid to the credit card company? Explain your method for finding the amount of interest paid.

### Wrapping Up the Activity

Research at least three different credit cards using the Internet. Find out whether the interest rates can change and what happens if minimum payments are not made on time. Write a one—page summary of your findings. Include a comparison of the three credit cards.

Source: Glencoe Algebra 1: USA Today related activities. *Verrrry Interesting!*. Accessed online at:  
[http://www.glencoe.com/sec/math/algebra/algebra1/algebra1\\_05/usa\\_today/index.php4/na/27\\_1](http://www.glencoe.com/sec/math/algebra/algebra1/algebra1_05/usa_today/index.php4/na/27_1)