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[RETIRED] MATH: The Cost of Minimum Payments

Paying the minimum on a credit card can feel a bit like running on a treadmill - you will keep chasing that balance but won't get very far! In this activity, you will learn how compound interest works by comparing monthly interest and credit card balances to see just how costly making only the minimum payments can be.

Math Topics	Personal Finance Topics
• Order of operations • Translating word problems	• Credit cards • Minimum payments • Compound Interest

Part I: Interactive Examples

These two videos provide information on how to calculate the cost of minimum payments. Follow your teacher's directions on which video(s) you should watch or skip ahead to the next section.



Paying the minimum payment



Paying ABOVE the minimum payment

MATH: The Cost of Minimum Payments

Part II: Practice Problem

With two other classmates, complete the following practice problem. Each of you will complete calculations for one character profile while your teammates will complete calculations for the other two character profiles.

- **Teacher Tip:** You can also divide your class into 3 sections, each section solving for the 3 different characters. Then, bring the whole class back together to compare their calculations and continue Part III together.

Three friends each have a balance of $5,000 on their credit cards with a 25% APR. They've decided that they will not make any other purchases on their cards until they pay off the debt and make varying amounts of monthly payments:



- Sharon can only make the credit card minimum payment, $150 per month
- Cecilia can set aside $400 per month to pay back her debt
- Alexander can pay $800 per month for his credit card

After 5 months, how much will each person have paid in interest so far and how large will their remaining balance be? Use the formulas below to calculate their interest and balance for each month.

$$I = \frac{APR}{12} \times B$$

$$N = (B + I) - P$$

I = interest

B = original balance

N = new balance

P = monthly payment

Character:			
Month / Billing Cycle	Interest	Monthly Payment	Balance
1			

2			
3			
4			
5			
Total			

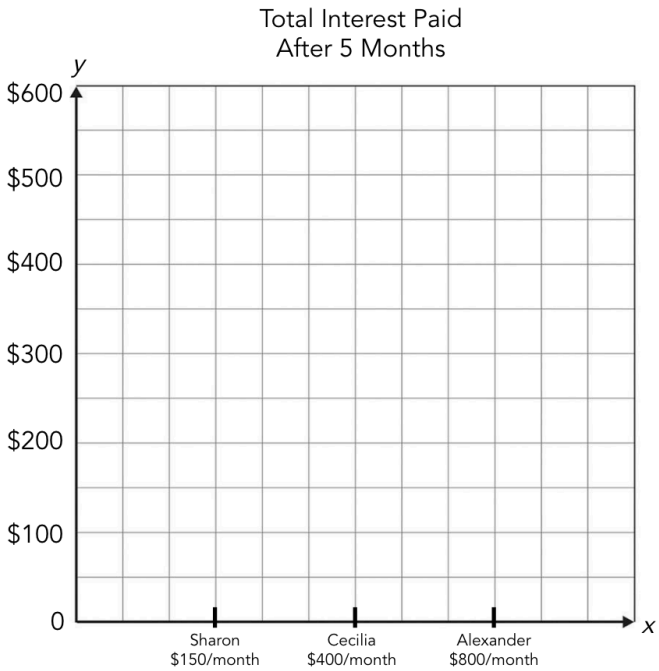
Part III: Summary and Reflection

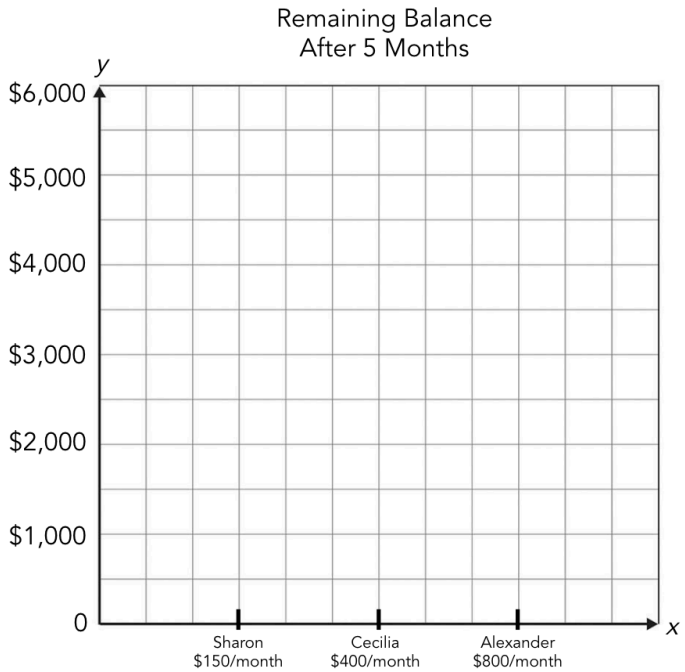
Share your calculations with your teammates to complete questions together.

5. What was each character's total interest and balance?

Character	Total Interest	Balance
Sharon		
Cecilia		
Alexander		

6. Graph the data below.





7. Explain why it's more costly to only pay the minimum payment amount for a credit card.

8. What advice might you give these 3 friends?

Ways to Modify This Activity:

Simplifying the Work:

- Provide all of the variables listed out for students. (Ex: Explicitly say that P = 100, etc.)
- Plug in ALL the numbers into the formula, and then have students just practice order of operations
- Use an Amortization Calculator to assist students understand the larger picture

Extended Challenge:

After solving the original problems, students can also:

- Create a complete amortization table to solve for WHEN the loan will be paid off
    - By Hand: May take a long time by hand, best to have the monthly payment be HIGH and the original balance be LOW
    - By Spreadsheet: Have students design a spreadsheet to calculate the rest of the amortization
- Create a complete amortization table to solve for the TOTAL interest paid over time it takes to pay off the debt completely. Then, compare the 3 interest amounts across the 3 different characters - this is a fantastic “lightbulb” moment for students to compare the total interest paid!