

Calculating loan payments

Using a case study, students explore how the amount borrowed, interest rates, and the term of a loan can increase or decrease the amount of loan payments.

Learning goals

Big idea

The amount of an installment loan payment amount is the result of several factors.

Essential questions

- How do principal, interest rate, and loan term affect loan payments?
- What criteria do you use to compare loan offers to get the best deal?

Objectives



- Make informed choices about credit offers
- Calculate monthly payments for loans based on principal, interest rate, and loan term

What students will do

- Calculate and analyze how monthly payments on a loan change based on the principal, interest rate, and term of the loan.
- Compare borrowing options to identify the best deal.
- Reflect on ways to reduce the amount owed on a loan.

KEY INFORMATION

Building block:

-  Executive function
-  Financial knowledge and decision-making skills

Grade level: High school (9-12)

Age range: 13-19

Topic: Borrow (Managing credit)

School subject: CTE (Career and technical education), Math

Teaching strategy: Simulation, Cooperative learning

Bloom's Taxonomy level: Apply

Activity duration: 75-90 minutes

STANDARDS

Council for Economic Education
Standard IV. Using credit

Jump\$tart Coalition
Credit and debt - Standard 1

Preparing for this activity

- Print copies of all student materials for each student, or prepare for students to access them electronically.

What you'll need

THIS TEACHER GUIDE

- Calculating loan payments (guide)
[cfpb_building_block_activities_calculating-loan-payments_guide.pdf](#)

STUDENT MATERIALS

- Calculating loan payments (worksheet)
[cfpb_building_block_activities_calculating-loan-payments_worksheet.pdf](#)

Exploring key financial concepts

Principal, interest rate, and loan term are used to determine the monthly payment made when repaying a loan. Principal is the money you originally agreed to pay back on a loan. It is often referred to as the amount of money you borrowed. The interest rate is the cost you will pay each year to borrow the money, expressed as a percentage rate. It does not reflect fees or any other charges you may have to pay for the loan. You'll often see interest rates for a loan expressed as an APR (annual percentage rate). APR is a broader measure of the cost to you of borrowing money, also expressed as a percentage rate. In general, APR reflects not only the interest rate but also fees and other charges that you pay to get the loan. For that reason, your APR is usually higher than your interest annual percentage rate).

The rate charged is often affected by prevailing interest rates, the rates charged by competing lending institutions, and a borrower's risk level (how creditworthy they are based on previous financial habits). A borrower's income and the amount of any down payment also can affect the interest rate that is offered. Term refers to the length of the loan.

The lower the loan numbers are, the better the outcome for you.

- ✓ Lower principal = less money you borrow and therefore less money you will repay
- ✓ Lower interest rate = less interest you will be charged to borrow money
- ✓ Shorter term = fewer total payments you will have to make

Teaching this activity

Whole-class introduction

- Distribute the “Calculating loan payments” worksheet to students.
- We recommend students use calculators to apply the simple interest formula to compute and compare the loan offers.
- Be sure students understand key vocabulary:
 - **Principal:** The amount of money that you originally received from the creditor and agreed to pay back on the loan with interest.
 - **Interest rate:** A percentage of a sum borrowed that is charged by a lender or merchant for letting you use its money. A bank or credit union may also pay you an interest rate if you deposit money in certain types of accounts.
 - **Term:** A fixed or limited period of time for which something lasts or is intended to last (for example, a five-year loan, a three-year certificate of deposit, a one-year insurance policy, a 30-year mortgage).
- Review with students how to use an oversimplified interest formula of principal x rate x term to calculate monthly payments. The simple interest formula is often written as $I = P \times R \times T$
 - I = the amount of simple interest
 - P = the principal amount borrowed
 - R = the interest rate of the loan
 - T = the outstanding term in years from the date of disbursement to date of repayment, with periods less than 1 year computed on the basis of 365 days/year

TIP

Visit CFPB’s financial education glossary at consumerfinance.gov/financial-education-glossary/.

TIP

This is an oversimplified approach to determining interest. The actual math will likely be more complicated.

Group work

- Have students work in pairs to review the case study and figure out the amount of interest, total amount due, and the monthly payments for each of the three options.

Wrap-up

- Once all of the calculations have been completed, ask students to share which credit offer they chose and discuss possible outcomes as a class.
- If students seem ready, ask them to consider how paying more than the required monthly payments may affect the time it takes to pay off the loan as well as the overall cost of the loan.

Suggested next steps

Consider searching for other [CFPB activities](#) that address the topics of spending, including paying for college, or borrowing, including getting loans and managing credit.

Measuring student learning

- Evidence of student learning can be measured by their ability to include proper data from the case study and complete correct calculations using the oversimplified interest formula.
- Students' reflection on which credit offer they would choose will provide a picture of their broader understanding of how principal, rate, and loan term influence credit decisions.

Answer guide

For purposes of explaining how interest can add to the cost of an original purchase amount, this activity uses an oversimplified formula for calculating interest, and answers in this guide reflect the use of this formula. It is important to note that this is an oversimplified example and that actual interest may be more complicated for a loan of multiple periods.

The answers below represent the results of the suggested mathematical calculations.

COMPARE OPTIONS 1, 2, AND 3

	Principal	Rate	Term	Interest charged	Total amount paid	Monthly payment
Option 1	\$1,500	9.5%	2 years	\$285	\$1,785	\$74.38
Option 2	\$1,350 (represents a 10% discount)	12%	2 years	\$324	\$1,674	\$69.75
Option 3	\$1,500	12%	2 years - 1 year of interest free	\$180	\$1,680	\$70.00

How do the different principal amounts and the different interest rates affect the loan?

- The lower interest rate of Option 1 makes it the lowest in the “interest charged” column.
- The lower principal offered in Option 2 decreases the “total amount paid” column making it the lowest repayment option.

What is the benefit of the “zero interest” offer that goes with the new credit card? What happens when the “zero interest” period ends?

- The zero interest offer means that she pays no interest for 1 year. After that time, the interest rate is 12% for 1 year. While this is a savings over the original calculation for Option 3, it is still more than Option 2.

Reflection question

Keep in mind that students’ answers may vary. The important thing is for students to have reasonable justification for their answers.