

Chapter 7 Project

Brand New Ride or Gently Used Classic?

An activity to investigate the cost of buying a new car versus a pre-owned vehicle.

According to Wikipedia, there were around 276 million vehicles in the United States in 2018, most of which were passenger vehicles. Since your busy life as a college student certainly forces you to be on the go, owning a car may already be part of your daily life or it may be a plan for the future. Either way, it is important to explore the differences when it comes to financing a brand-new vehicle versus a pre-owned one.

New cars are more expensive and usually come with offers for lower interest rates, while pre-owned vehicles cost less and are often financed at higher rates.

Consider two vehicles. One is a brand new 2019 Honda Civic with a Manufactured Suggested Retail Price (MSRP) of \$19,550. The other is a two-year old model of the same vehicle listed online for \$16,500. You have saved \$2000 to use as a down payment and the dealer has already included any applicable fees in the price, such as taxes. You plan on taking 5 years to pay off the loan.

The table below shows the price and interest rate for each option.

	Price	Interest Rate
2019 Honda Civic	\$19,550	2.5%
2017 Honda Civic	\$16,500	4.0%

1. Taking into consideration the \$2000 you have saved for the down payment, how much would you finance for the purchase of the 2019 model?
2. What percentage of the price of the new vehicle is your down payment?
3. Use the formula for a loan payment to determine the monthly payment on the purchase of the 2019 model.
4. Determine the Total Amount Paid when financing the 2019 model. Recall that the total amount paid is the down payment plus the sum of all monthly payments.
5. Determine the Finance Charge for purchasing the 2019 model.
6. Repeat 1–5 above for the pre-owned model. That is, find the amount financed, what percentage of price the down payment is, the monthly payment, the total amount paid, and finance charge for the purchase of the 2017 model.
7. Organize your information on the table below.

$$PMT = \frac{P\left(\frac{r}{n}\right)}{1 - \left(1 + \frac{r}{n}\right)^{-nt}}$$

	2019 Honda Civic	2017 Honda Civic
Price	\$19,550	\$16,500
Interest Rate	2.5%	4.0%
Down Payment		
Amount Financed		
Monthly Payment		
Total Amount Paid		
Finance Charge		

8. The pre-owned vehicle has a lower monthly payment, which sounds appealing when budgeting your expenses. Make an argument, using the figures in your table, that the money borrowed to buy a pre-owned vehicle is actually “more expensive” than the money borrowed to purchase the new vehicle.
9. A simple annuity is a type of investment where an investor makes regular deposits into an account that pays interest over a fixed period of time. The formula for the balance of an annuity is given by

$$P = \frac{PMT \left(\left(1 + \frac{r}{n} \right)^{nt} - 1 \right)}{\frac{r}{n}}$$

where PMT is the monthly payment amount, t is the number of years, n is the number of payments per year, r is the annual interest rate written as a decimal, and P the balance in the account after t years.

Suppose that instead of buying a new car now, you decide to invest in an annuity for five years. Every month you will deposit an amount equal to the new car loan payment in an account that earns 3% per year for five years.

- a. What are the values of n , t , and r in this case?
- b. Use the formula provided to compute the balance P after five years.
- c. Would you rather buy the new car now or save for the next five years? Explain the financial advantages of waiting and the possible personal disadvantages of doing so.