-**Exponential growth can work for or against you-**

**Made up future scenario:**

 You’ve finally graduated (yay!), and you’ve been applying for jobs all year. Finally you are offered an exciting position in your field as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It pays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ annually!

*(Find the average starting pay for that job in the specified region of the country you plan to live.)*

This is what you have been hoping for. I mean you’ve finally made it. Things are looking good except... the rust bucket you’ve driven during college is ugly and will probably need some repairs before long...

**Option 1**:

You decide to treat yourself to a brand new car that you have wanted. You’ll be able to afford the payments, and you deserve this, so why not?

The car costs: $P\_{0}= $**$ 25,000**  *(MSRP for a reasonable brand new car you want)*

That seems like a lot, but you are financing this for  **60 months** (5 years) @  **7.4%** APR and the payments are $500/month, which you can afford, right? Remember you just got a new job!

Cost: **$500/month = $6000/year**

Total cost to you after interest: about **$ 30000** .

...

Five years pass. The car is now worth: $C=P\_{0}\left(0.78\right)^{5}$= **$ 7,218** (*This is our depreciation formula from our homework.)*

You’ve driven your lovely car for five years. Your net investment is **$7218-$30000 = -$22,782**

Now, your car is no longer new, but you can trade it in and get another new car without increasing your payments...

**and continue this cycle.**

**Here’s a link to try different numbers and run your own scenario (e-version document on Campusweb)** <https://www.bankrate.com/calculators/auto/auto-loan-calculator.aspx>

 **Option 2**

**Option 2**:

While you would love a new car, cars depreciate and you don’t have the money to buy one with cash, so instead you decide to save/invest your money.

After saving up $1000 for emergency car repairs on your clunker, you put back  **$500** /month, ($6000/year) for 5 years in a mutual fund that averages **6.5%** interest annually (only $5000 the first year because of the emergency fund). If you budget this, you can afford it, right? Remember you just got a new job!

After 5 years, you have saved + interest: **$ 34,403** .

That’s a **$33,967-$30,000 = $4,403**  net investment, but that’s just the start.

You decide to take $13967, and buy yourself a quality used vehicle (yay upgrade!). You have $20000 in your savings fund now. Since you paid cash for your car, you have no monthly payment, so you continue to invest your $500/month in the mutual fund...

**and continue THIS cycle.**

After 5 more years you have **$ 63,224**  ...and 5 more: **$ 123,046**  ...and 5 more: **$ 205,840 .**

Remember you are only putting in an additional $6000 per year, but because of exponential growth you are receiving interest on what you already have.

*If you continue this cycle for 38 years after graduation (apx retirement age), the total investment of your $228,000 ($6000 per year times 38 years) is over a million dollars. Possibly, you have moved up in your career and increased your income, and been able to invest even more than this. Besides this investment, by budgeting the rest of your income, you are still able to enjoy life, save for emergencies/large purchases, and help others in need.*

*Note: Unpaid DEBTS can grow in a similar way to the investment in this scenario, often with much higher interest rates, which is not a good thing.*

**Here’s a link to try different numbers and run your own scenario (e-version document on Campusweb)**

<https://www.bankrate.com/calculators/savings/compound-savings-calculator-tool.aspx>

*Notice the shape of the graph.*

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**These are just two examples of (overly simplified, but very common) scenarios to show how a cycle of debt vs a cycle of investing can shape your future.**

**This is a math class, so I’ll say it this way: Exponential growth can work for or against you!**

**This is the reason that...**

* **UNNECESSARY DEBT IS BAD even at low interest rates**
* **INVESTING EARLY IS GOOD**
* **BUDGETING YOUR EXPENDITURES AND EVEN YOUR SAVINGS IS IMPORTANT**