PC11 Financial Literacy Lesson

As a young person, you have the power to be wealthy even with a minimum wage job. By living within (or below) your means, you will have money left over to invest. If you invest $6 a day (less than the cost of some Starbucks drinks) for 50 years (at an annual interest rate of 10%) your investment will grow to be more than $3 million!

- compound interest
- introduction to investments / loans with regular payments, using technology
- buying / leasing

1. The simple interest formula is $A = P(1 + rt)$. If the annual interest rate is 10%. Explain how a $1000 investment would grow over three years.

2. Enrichment: $A = P(1 + rt)$ show that $I = Prt$

3. The compound interest formula is $A = P\left(1 + \frac{r}{n}\right)^{nt}$, where n represents the number of compounding periods. Suppose you borrow $400,000 from the bank for a mortgage. Calculate how much your debt grows to be if you decide not to pay in 10 years and the 3% annual mortgage rate is calculated:
    a. Annually

    b. Monthly

    c. Twice a month

    d. Daily

    e. Every second

f. What do you notice about these different time frames?

g. Why is the compound interest formula more accurate than the simple interest formula?

4. Choose the best option:
   - Pay $12,000 into your mortgage at the end of each year
   - Pay $1,000 each month into your mortgage
   - Pay $500 twice a month into your mortgage
   - Never pay off your mortgage – put all of your extra money into investments
     As often as possible (twice a month)

5. Graph $y = 5000(1.08)^x$ on desmos.com
   a. What is the principal amount?

   b. What is the annual growth rate?

   c. How much money will you have in 10 years?

   d. How many years until you become a millionaire?

   e. How can you become a millionaire more quickly?

6. Without making regular contributions, how quickly would your initial $5000 investment grow to be one million dollars if the stock market breaks even at 0% growth (such as the Japanese stock market which stagnated for 3 decades)?

7. Suppose you owe $5000 on your credit card.
   Interest is calculated daily at an annual rate of 29.99%. How much will your debt grow to be in:
   a. One year?

   b. Five years?

   c. 10 years?

8. You borrow $50,000 in student loans.
   The annual interest rate is 10% and interest is calculated daily.
   How much does your debt grow to be in 7 years?

9. Match the following typical interest rates
   (5%, 10%, 30%, 500%):
   a. Credit card

   b. Private student loan
      (federal students loan rates are lower)

   c. Mortgage

   d. Payday loan

10. Suppose you receive a Payday loan at a "reasonable" interest rate of 500%.
    You borrow $1000 to buy groceries and pay your bills.
    How much do you owe if you do not pay for:
    a. a month?

    b. a year?

    c. for 5 years?

11. You accidentally forget to pay off the balance of your Payday loan debts. You still owe 5 cents. How much does this trivial debt grow to be in:
    a. a year?

    b. 6 years?

12. Suppose you invest $5000. Your stocks average of 8% interest over 50 years. Banks charge Management Expense Ratio (MER) fees.
    If they skim 2.5% of your investments, how much money did they take from you?

13. Use the online "get smarter about money" compound interest calculator to determine how much money you would have saved if you invest one $7 Starbucks drink each day for 50 years at an optimistic 10% annual interest rate.

14. Suppose you save $1 million for your retirement. Can you spend $100,000 per year indefinitely?

15. What is an index fund?

16. True or False:
    a. A car is an investment.

    b. It is better to buy rather than lease a car.

    c. New phones depreciate faster than new cars.

    d. You can invest money on a regular basis using automatic payments.

    e. You can pay your credit card bills using automatic payments, so you do not miss a payment.

    f. Bankruptcy wipes out student loans.

    g. It is a good idea to do your research and get multiple bids before making major purchases such as a car or home furnace.

17. Which of the following can be investment accounts?
    - FHSA
    - RRSP
    - TFSA
    - RESP

18. What are some key aspects of being financial literate?

19. Describe the process of investing $100 online using online banking.

20. Challenge: Payday lender may charge $20 for every $100 borrowed for a period of two weeks. Find the annual interest rate assuming interest is calculated on a daily basis.