

2.1-2.3: Spreadsheets, Simple and Compound Interest and Savings Plans

Class Prep Assignment

Due at the beginning of next class

Personal Reflections:

1. Do you use a budget? Why or why not?

2. List some places in your finances where you might be able to save a few dollars or more per week or per month.

2.2: Simple and Compound Interest

Simple Interest

Definition: Interest is only earned (or paid) on the original amount.

Example: You invest \$500 and you earn 6% interest every year for 5 years.

Year	Interest	Balance
Start		\$500
1		
2		
3		
4		
5		

Compound Interest

Definition: Interest is earned on the original amount and any interest added to the account.

Example: You invest \$500 at a rate of 6% interest compounded yearly for 5 years.

Year	Interest	Balance
Start		\$500
1		
2		
3		
4		
5		

Formulas:

Using Spreadsheet Formulas for Compound Interest

You will need to use Microsoft Excel or Google Sheets while you watch these videos. You can use a computer, tablet or smart phone with the Google Sheets App.

Future Value Formula
$$=FV(\text{rate}, \text{nper}, \text{pmt}, [\text{pv}], [\text{type}])$$
Present Value Formula
$$=PV(\text{rate}, \text{nper}, \text{pmt}, [\text{fv}], [\text{type}])$$

Inputs:

rate =

nper =

pmt =

pv =

fv =

[type] =

Example 1. If you invest \$500 at 6% interest, calculate the balance after 5 years for each compounding interval. Write the formula used and inputs in proper syntax.

Simple Interest

Compounded Yearly

Compounded Quarterly

Compounded Monthly

Compounded Daily (365)

Compounded Continuously

Compounding Continuously

If we let the number of compounding periods go to infinity we get a base of e in our function.

$$A = Pe^{rt}$$

$$= P * \exp(\text{rate} * \text{years})$$

Effective Rate

The corresponding rate if compounded yearly. Used to compare different compounding options.

=effect(nominal rate, periods per year)

Example 2. Write the formula used and the inputs in proper syntax. Answer each question with a complete sentence, including units.

a. How much would you need to deposit in an account that pays 5.25% compounded monthly to have \$20,000 in 20 years?

b. You get an inheritance of \$15,000 and you decide to put it in an account that pays 7.1% interest compounded continuously. How much would it be worth in 25 years?

c. You decide to save your tax refund of \$1000 in an account that pays 6.5% compounded quarterly. How much would you have in 15 years?

d. You are shopping for savings accounts and you find one with a rate of 3.25% compounded monthly and one with a rate of 3.15% compounded daily. Find the effective rates to determine which account has a better rate.

2.3: Savings PlansClass Prep AssignmentDue at the beginning of next class

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Future Value Formula
$$=FV(\text{rate}, \text{nper}, \text{pmt}, [\text{pv}], [\text{type}])$$
Present Value Formula
$$=PV(\text{rate}, \text{nper}, \text{pmt}, [\text{fv}], [\text{type}])$$
Saving with an initial deposit and/or monthly payments.

Example 1. Write the formula used and the inputs in proper syntax. Answer each question with a complete sentence, including units.

a. You want to save \$100 per month at an annual rate of 8% interest. How much will you have after 15 years?

b. You want to save \$1000 now and \$50 per month for 10 years. How much will you have if you find an account with 7% interest?

Payment Formula
$$=PMT(\text{rate}, \text{nper}, \text{pv}, [\text{fv}], [\text{type}])$$

Example 2. Write the formula used and the inputs in proper syntax. Answer each question with a complete sentence, including units.

a. You want to save \$30,000 for the down payment on a house in 5 years at an annual rate of 5% interest. How much do you need to set aside per month?

b. Your company needs \$2,000,000 for an expansion project in 5 years. How much should be deposited quarterly in an account that earns 8% interest compounded quarterly?