Excel's Golden Rule: If an Excel solution input can change, put it into a cell, label it, and refer to it with a cell reference / table reference.

Excel Model: An Excel solution built to solve a problem, make calculations or perform data analysis that can be used more than 1 time.

Why Excel's Golden Rule?

1) It provides good documentation of the worksheet solution/model so it is easy to understand.
2) It makes it easy to update the solution/model later.
3) It reduces errors because you do not "Hard Coding" inputs into formulas.

Research has shown that a common error in spreadsheets is "Hard Coding":
http://www.strategy-at-risk.com/2009/03/03/the-risk-of-spreadsheet-errors/

Task at Hand:

BECU Bank offers 2 year CD with an APR of 4%, compounded Monthly

Build a schedule that shows how much interest you will earn each period if you invest $16,000

Lump Sum Invested = PV = Present Value	16000
Annual Percentage Rate = APR	0.04
Years	1
Periods per Year = PPY	12
Total Periods = PPY*Years	12
Period Rate = APR/PPY	0.0033

C19: =C18*C17
C20: =C16/C18

Periods	Intereset Paid	Balance
0		16000.0000
1	53.3333	16053.3333
2	53.5111	16106.8444
3	53.6895	16160.5339
4	53.8684	16214.4024
5	54.0480	16268.4504
6	54.2282	16322.6785
7	54.4089	16377.0875
8	54.5903	16431.6778
9	54.7723	16486.4500
10	54.9548	16541.4049
11	55.1380	16596.5429
12	55.3218	16651.8647

D23: =C15
C24: =D23*C20
D24: =D23+C24

Effective Rate	0.0407
End Balance = FV (Future Value	16651.8647

C37: =(1+C20)^C18-1
C38: =C15*(1+C37)

PV	16000
APR	0.04
Years	1
PPY	12
Total Periods	12
Period Rate	0.0033

I17: =12/12
I19: =I18*I17
I20: =I16/I18

Periods	Intereset Paid	Balance
0		16000.0000
1	53.3333	16053.3333
2	53.5111	16106.8444
3	53.6895	16160.5339
4	53.8684	16214.4024
5	54.0480	16268.4504
6	54.2282	16322.6785
7	54.40892849	16377.08748
8	54.59029159	16431.67777
9	54.77225923	16486.45003
10	54.95483342	16541.40486
11	55.1380162	16596.54288
12	55.32180959	16651.86469

H23: =SEQUENCE(I19+1,,0)
J23: =I15*(1+I20)^H23#
I24: =DROP(J23#,1)-DROP(J23#,-1)

Next page shows math behind Compound Interest →→→→

Principal = 100 → PV = Present Value

APR = 0.04 or 4% → APR = Annual Percentage

periods per year = 4 → PPY = Compounding Rate Periods per year

period Rate = $\frac{0.04}{4} = 0.01$

periods	Interest Paid	New Balance
0		100
1	100 * 0.01 = 1	100 + 1 = 101
2	101 * 0.01 = 1.01	101 + 1.01 = 102.01
3	102.1 * 0.01 = 1.0201	102.01 + 1.0201 = 103.0301
4	103.0301 * 0.01 = 1.030301	103.0301 + 1.030301 = 104.060401

Future Value = FV =

{universal Lump sum Deposit Future Value Formula} = $FV = PV * \left(1 + \frac{APR}{PPY}\right)^{\wedge\left(PPY * Years\right)}$

FV = Future Value

PV = present Value

APR = Annual percentage Rate

PPY = compounding periods per year

Years = # Years Investment

Create Formula to calculate End CD Value:

period	
1	$100 + 100 * 0.01 = 100 + 1 = \underline{101}$ $100 * 1 + 100 * 0.01$ ↙ ↙ Factor out 100 $100 * (1 + 0.01)$ Left with
2	$100 * (1 + 0.01) + 100 * (1 + 0.01) * 0.01 = \underline{102.01}$ ↙ ↙ Factor out $100 * (1 + 0.01) * (1 + 0.01)$ Left with
3	$100 * (1 + 0.1) * (1 + 0.01) + 100 * (1 + 0.01) * (1 + 0.01) * 0.01 =$ ↙ ↙ Factor out $\underline{103.0301}$ $100 * (1 + 0.01) * (1 + 0.01) * (1 + 0.01)$ Left with
4	Use same Logic to get: $100 * (1 + 0.01) * (1 + 0.01) * (1 + 0.01) * (1 + 0.01) =$ $\underline{104.060401}$

Formula Becomes: $100 * (1 + 0.01)^{4} = 104.060401$

{Universal Lump Sum Deposit Future Value Formula} $= FV = PV * \left(1 + \frac{APR}{PPY}\right)^{(PPY * years)}$