

Name: _____

Money in the Bank

Javier has saved \$1500 and wishes to invest his savings into the Jefferson Fund, which will pay 4% annual interest. His friend Charlie has \$500 and would like to invest his money in the Washington Fund, earning 12% annual interest.

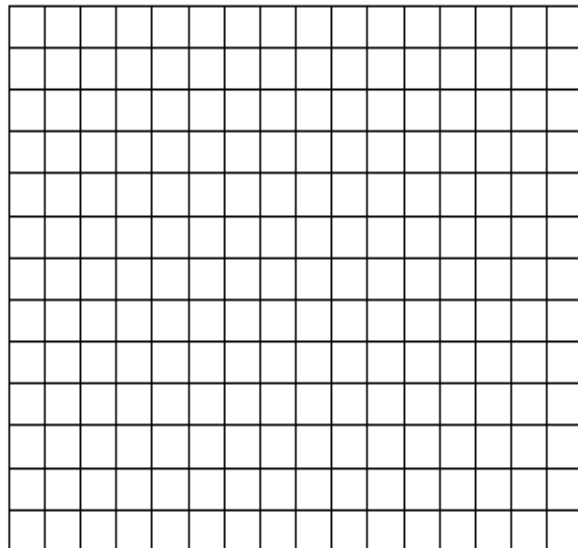
1. Write an equation for both Javier and Charlie that will allow you to calculate the balance of this deposit after any number of years x .

Javier: $y =$

Charlie: $y =$

2. Use the equations to make a table and a plot showing the growth of their investments for a period of 10 years.

Time (yrs)	Javier's balance	Charlie's balance
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



3. Describe the pattern of growth in each investment as time passes.
 - a. Why is the balance not increasing at a constant rate?
 - b. How could this pattern of increase be predicted from the shape of the graph?
 - c. How long would it take to double the \$1500 investment?
 - d. How long would it take to double the \$500 investment?
 - e. What year would Charlie's investment balance exceed Javier's investment balance?
4. How will the rules change as the interest rate changes?
5. How will the rules change as the amount of initial investment changes?

Enrichment: Call several banks and ask about their investment options. Compare the growth of a specific amount of investment for several different options. Choose the option that best meets your need. Explain.

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Answer Key

Javier has saved \$1500 and wishes to invest his savings into the Jefferson Fund, which will pay 4% annual interest. His friend Charlie has \$500 and would like to invest his money in the Washington Fund, earning 12% annual interest.

- Write an equation for both Javier and Charlie that will allow you to calculate the balance of this deposit after any number of years x .

Javier: $y = 1500(1.04)^x$

Charlie: $y = 500(1.12)^x$

- Use the equations to make a table and a plot showing the growth of their investments for a period of 10 years. (Graph unavailable on answer key.)

Time (yrs)	Javier's balance	Charlie's balance
0	1500	500
1	1560	560
2	1622.40	627.20
3	1687.30	702.46
4	1754.79	786.76
5	1824.98	881.17
6	1897.98	986.91
7	1973.90	1105.34
8	2052.85	1237.98
9	2134.97	1386.54
10	2220.37	1552.92

3. Describe the pattern of growth in each investment as time passes.

Javier's investment starts out (y-intercept) with a greater amount of money and increases at a slower rate than Charlie. Charlie's beginning investment (y-intercept) is lower than Javier's but increases at a faster rate.

- a. Why is the balance not increasing at a constant rate?

The balances are not increasing at a constant rate because the investments are increasing a certain **percent** of each year's balance. As the investment balance changes every year, the percent of increases changes per year.

- b. How could this pattern of increase be predicted from the shape of the graph?

The graph does not show a linear function (straight line) but the shape of half of a parabola.

- c. How long would it take to double the \$1500 investment?

Approximately 18 years. You see this in the table when $y =$ about 3000

- d. How long would it take to double the \$500 investment?

Approximately 7 years. You see this in the table when $y =$ about 1000

- e. What year would Charlie's investment balance exceed Javier's investment balance?

4. How will the rules change as the interest rate changes?

Approximately 15 years. You see this in the table when the y value for Charlie's exceeds Javier's balance

5. How will the rules change as the amount of initial investment changes?

The number in front of the parenthesis changes (i.e. $y = a(b)^x$). The a changes..which is the y intercept.

Enrichment: Call several banks and ask about their investment options. Compare the growth of a specific amount of investment for several different options. Choose the option that best meets your need. Explain.