LESSON MAKER PRO

Money Over Time

Model yearly changes in savings, loans, and value.

HIGH SCHOOL · MM.FPM.A

MM.FPM.A "Mathematical models involving growth and decay are useful in solving real-world problems involving borrowing and investing; spreadsheets are a frequently-used and powerful tool to assist with modeling financial situations."

NAME _____ DATE _____

BALANCE BY BALANCE

For yearly growth, multiply the current balance by 1 + the rate written as a decimal. For yearly decay, multiply by 1 - the rate. In a spreadsheet, enter the starting balance, then use a formula to multiply the balance above it by the same factor each year.

WORKED EXAMPLE

A $125 investment grows 20% each year. Use the spreadsheet to find its balance after 3 years.

INVESTMENT SPREADSHEET

A: Year	B: Balance ($)
0	125
1	=B2*1.20
2	=B3*1.20
3	=B4*1.20

1. Year 1: 125 * 1.20 = 150
2. Year 2: 150 * 1.20 = 180
3. Year 3: 180 * 1.20 = 216

Answer: $216

PRACTICE 4 problems

1 You invest $400 at 5% yearly growth. What is the balance after 1 year?

ANSWER _____

2 A $800 savings balance grows 25% in 1 year. What is the new balance?

ANSWER _____

3 A $100 loan grows 10% each year with no payments. How much is owed after 2 years?

ANSWER _____

4 A $500 device loses 10% of its value in 1 year. What is its value then?

ANSWER _____

APPLY IT Show your work

1 Your concert fund starts at $160 and grows 25% each year. How much will it hold after 2 years?

WORK SPACE

ANSWER _____

2 You borrow $200 for a used bike. The spreadsheet adds 10% interest each year, with no payments. How much do you owe after year 2? How much of that is interest?

BIKE LOAN SPREADSHEET

A: Year	B: Balance owed ($)
0	200
1	=B2*1.10
2	=B3*1.10

ANSWER _____

CHALLENGE One step up

Two $400 bike loans last 2 years. Loan A adds 10% to the current balance each year. Loan B adds $40 each year. With no payments, which loan costs less at the end, and by how much? Show both balances.

WORK SPACE AND ANSWER

Money Over Time

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	You invest $400 at 5% yearly growth. What is the balance after 1 year?	**$420**
2	A $800 savings balance grows 25% in 1 year. What is the new balance?	**$1,000**
3	A $100 loan grows 10% each year with no payments. How much is owed after 2 years?	**$121**
4	A $500 device loses 10% of its value in 1 year. What is its value then?	**$450**

PART 2 · APPLY IT

1. **$250** Multiply by 1.25 twice: 160 * 1.25 = 200, then 200 * 1.25 = 250.
2. **$242 owed; $42 interest** The formulas give 200 * 1.10 = 220 and 220 * 1.10 = 242. Subtract the $200 borrowed to find $42 in interest.

CHALLENGE

Loan A: $400 * 1.10 * 1.10 = $484. Loan B: $400 + $40 + $40 = $480. Loan B costs $4 less.

Accept equivalent calculations. Loan A compounds yearly, while Loan B adds a fixed amount each year.