LESSON MAKER PRO

Money Over Time

Find what money is worth now or later.

HIGH SCHOOL · MA.912.FL.3.3

MA.912.FL.3.3 "Solve real-world problems involving present value and future value of money"

NAME _____ DATE _____

PRESENT AND FUTURE VALUE

Use $FV = P(1 + r)^t$ to find how much a deposit will be worth in the future. Use $PV = FV/(1 + r)^t$ to find how much you need now to reach a future amount. Write the interest rate as a decimal and use annual compounding unless the problem says otherwise.

WORKED EXAMPLE

A savings account has $800 and earns 10% interest compounded annually. What is its future value after four years?

1. $r = 0.10$ and $t = 4$.
2. $FV = 800(1 + 0.10)^4$.
3. $FV = 800(1.4641) = 1{,}171.28$.

Answer: $1,171.28

PRACTICE 6 problems

1 You deposit $240 in an account that earns 25% interest compounded annually. What is the future value after one year?

ANSWER _____

2 You want to have $480 in one year. Your account earns 20% interest compounded annually. What present value must you deposit now?

ANSWER _____

3 A $600 deposit earns 20% interest compounded annually for two years. Find its future value.

ANSWER _____

4 A payment of $675 is due in one year. If money can earn 50% interest compounded annually, what is the present value of that payment?

ANSWER _____

5 You place $900 in an account earning 25% interest compounded annually for two years. What is the future value?

ANSWER _____

6 You need $972 in two years. An account earns 20% interest compounded annually. What amount must you deposit now?

ANSWER _____

APPLY IT Show your work

1 Jordan puts $1,000 in a savings account that earns 20% interest compounded annually. Jordan plans to buy a $1,400 laptop in two years. Will Jordan have enough money for the laptop? If so, how much money will be left after buying it?

WORK SPACE

ANSWER _____

2 A career certification course is expected to cost $900 in two years. Alina's savings account earns 20% interest compounded annually. How much must Alina deposit now so the account will have $900 in two years?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Sam can pay $4,800 now for a used car or pay $6,000 in two years. If money can earn 25% interest compounded annually, which choice has the lower cost in today's dollars, and by how much? Show your reasoning.

WORK SPACE AND ANSWER

ANSWER KEY

Money Over Time

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	You deposit $240 in an account that earns 25% interest compounded annually. What is the future value after one year?	**$300**
2	You want to have $480 in one year. Your account earns 20% interest compounded annually. What present value must you deposit now?	**$400**
3	A $600 deposit earns 20% interest compounded annually for two years. Find its future value.	**$864**
4	A payment of $675 is due in one year. If money can earn 50% interest compounded annually, what is the present value of that payment?	**$450**
5	You place $900 in an account earning 25% interest compounded annually for two years. What is the future value?	**$1,406.25**
6	You need $972 in two years. An account earns 20% interest compounded annually. What amount must you deposit now?	**$675**

PART 2 · APPLY IT

1. **Yes. The account will be worth $1,440, so Jordan will have $40 left.** Find the future value: $1{,}000(1.20)^2 = 1{,}440$. Compare $1,440 with the $1,400 laptop price.
2. **$625** Use present value: $PV = 900/(1.20)^2 = 900/1.44 = 625$.

CHALLENGE

Paying $6,000 in two years has the lower cost in today's dollars. Its present value is $6{,}000/(1.25)^2 = \$3{,}840$, which is $960 less than $4,800.

Accept equivalent numerical work that uses the correct annual compounding formula. For the challenge, accept a correct comparison based on the deferred payment's present value of $3,840.