

A Sum Of \$3000 Is Put In A Bank For 2years. If The Bank Pays 6 1/4% Interest Per Annum, What Is The Amount

A Sum Of 3000 Is Put In A Bank For 2years. If The Bank Pays 6 1/4% Interest Per Annum, What Is The Amount is a common problem in basic financial mathematics, particularly when it comes to understanding interest calculations. Whether you're a student preparing for exams, a new investor trying to understand how your savings grow, or simply curious about how banks calculate interest, understanding this concept is fundamental. In this article, we'll explore how to compute the total amount accumulated after two years, given an initial principal and a fixed annual interest rate. We will delve into simple interest and compound interest, providing clear explanations and step-by-step calculations to help you grasp the concepts thoroughly.

Understanding the Basics of Interest Calculation

Before diving into calculations, it's important to understand what interest is and the two main types of interest calculations used in banking:

Simple Interest

Simple interest is calculated only on the original principal amount throughout the investment period. The formula is:

$$\text{Simple Interest} = P \times r \times t$$

where:

- P = Principal amount (initial sum invested)
- r = Annual interest rate (in decimal form)
- t = Time in years

Compound Interest

Compound interest involves earning interest on both the principal and previously accumulated interest. The formula is:

$$A = P \times (1 + r)^t$$

where:

- (A) = Amount after interest
- (P) = Principal
- (r) = Annual interest rate (decimal)
- (t) = Number of years

In most banking contexts, unless specified otherwise, the interest is compounded periodically—annually, semi-annually, quarterly, or monthly. For this problem, since the annual rate is given plainly, we will assume simple interest unless stated otherwise.

Calculating the Interest for 2 Years at 6 1/4% Per Annum

Given:

- Principal $(P = 3000)$
- Annual interest rate $(r = 6\frac{1}{4}\% = 6.25\% = 0.0625)$
- Time $(t = 2)$ years

Let's first confirm whether to use simple or compound interest. Typically, in such questions, unless specified, simple interest is assumed. We will demonstrate both calculations for clarity.

Simple Interest Calculation

Using the simple interest formula:

$$\text{Interest} = P \times r \times t$$

Plugging in the values:

$$\text{Interest} = 3000 \times 0.0625 \times 2$$

Calculate step-by-step:

- $3000 \times 0.0625 = 187.5$
- $187.5 \times 2 = 375$

So, the total interest earned over two years is (375) .

The total amount after 2 years:

$$\text{Total Amount} = P + \text{Interest} = 3000 + 375 = 3375$$

Compound Interest Calculation

Assuming the interest is compounded annually, the formula becomes:

$$A = P \times (1 + r)^t$$

Plugging in the values:

$$A = 3000 \times (1 + 0.0625)^2$$

Calculating:

1. $(1 + 0.0625 = 1.0625)$
2. $(1.0625^2 = 1.12890625)$
3. $(3000 \times 1.12890625 = 3386.71875)$

Thus, the amount after 2 years with annual compounding:

$$A \approx 3386.72$$

Summary:

- With simple interest: 3375
- With compound interest: approximately 3386.72

Since the problem states the bank pays interest per annum but does not specify compounding frequency, the safest assumption is simple interest, resulting in 3375.

Understanding the Impact of Interest Rates and Time

Interest rates significantly influence the growth of your investment. Even a small increase in the annual rate can lead to a larger accumulation over time. Let’s explore how different interest rates or durations can affect your total savings.

Effect of Different Interest Rates

Suppose the interest rate increases or decreases; here’s how it impacts the total amount:

Interest Rate	Calculation (Simple Interest)	Total Amount after 2 Years
5%	$3000 \times 0.05 \times 2 = 300$	3300
10%	$3000 \times 0.10 \times 2 = 600$	3600
6.25% (original)		3375

This table shows that even a 1% change in interest rate can significantly impact total savings.

Effect of Longer Investment Duration

Similarly, extending the investment period increases the total amount, especially with compound interest:

Years	Compound Interest Amount	Simple Interest Amount
3	$3000 \times (1 + 0.0625)^3 \approx 3597.34$	$3000 + (3000 \times 0.0625 \times 3) = 3450$
4	$3000 \times (1 + 0.0625)^4 \approx 3824.81$	$3000 + (3000 \times 0.0625 \times 4) = 3300$

This highlights the power of compound interest over longer periods.

Practical Applications and Tips for Savers

Understanding interest calculations is crucial for making informed financial decisions. Here are some practical tips:

- Always check the interest compounding frequency:** Different banks may compound interest annually, semi-annually, quarterly, or monthly. More frequent compounding yields higher returns.
- Compare interest rates:** Even small differences in rates can lead to significant differences in final amounts over time.

3. **Consider the investment duration:** Longer investments generally accrue more interest, especially with compound interest.
4. **Understand the type of interest:** Clarify whether the bank offers simple or compound interest to accurately estimate your returns.
5. **Use financial calculators or formulas:** To avoid errors, leverage online calculators or the formulas discussed for precise estimations.

Conclusion

Investing 3000 at an annual interest rate of $6\frac{1}{4}\%$ over two years can grow to approximately 3375 with simple interest and about 3386.72 with compound interest compounded annually. The key takeaway is that even modest interest rates can significantly impact savings over time, especially when compounded regularly. Whether for personal savings, investments, or understanding bank statements, mastering these calculations empowers you to make smarter financial choices.

Remember, always verify the compounding frequency and interest rate details when dealing with financial institutions. With this knowledge, you can confidently estimate your potential earnings and plan your financial future more effectively.

Frequently Asked Questions

What is the principal amount invested in the bank?

The principal amount invested is \$3000.

What is the annual interest rate offered by the bank?

The bank pays an interest rate of $6\frac{1}{4}\%$ per annum.

How long is the money invested in the bank?

The money is invested for 2 years.

What formula is used to calculate the total amount after interest?

The total amount is calculated using the compound interest formula: $A = P(1 + r/n)^{nt}$, or for simple interest: $A = P(1 + rt)$.

Is the interest compounded or simple in this scenario?

The problem typically refers to simple interest unless specified otherwise.

What is the total amount after 2 years at 6 1/4% interest?

Using simple interest: $A = 3000 (1 + (0.0625 \times 2)) = 3000 (1 + 0.125) = 3000 \times 1.125 = \3375 .

How do you convert 6 1/4% to decimal for calculation?

Convert 6 1/4% to decimal by dividing 6.25 by 100, which equals 0.0625.

What is the final amount after 2 years of investment at this interest rate?

The final amount is \$3375.

Additional Resources

A Sum Of 3000 Is Put In A Bank For 2 Years. If The Bank Pays 6 1/4% Interest Per Annum, What Is The Amount?

When considering savings or investments, understanding how interest accumulates over time is fundamental. Suppose you deposit a sum of money into a bank account, and the bank offers a fixed interest rate per annum. How much will your investment grow after a specified period? This question is especially relevant for individual savers, investors, or anyone interested in the mechanics of compound or simple interest. In this article, we will explore the scenario where a sum of ₦3,000 is deposited in a bank for two years at an annual interest rate of 6 1/4%. We'll delve into the calculations involved, clarify the concepts of simple and compound interest, and guide you through determining the final amount.

Understanding the Scenario

Before proceeding with calculations, it's essential to understand the key components of the scenario:

- Principal (P): The initial amount deposited, which is ₦3,000.
- Interest Rate (r): The annual interest rate, expressed as 6 1/4%, or in decimal form.
- Time (t): Duration of the investment, in years, which is 2 years.
- Final Amount (A): The amount accumulated after 2 years, including interest.

The core question: What will be the amount in the account after 2 years?

Converting the Interest Rate

The given interest rate is 6 1/4%, which needs to be expressed as a decimal for calculation purposes.

- Percent to Decimal Conversion:

$$6 \frac{1}{4}\% = 6.25\% = 6.25 / 100 = 0.0625$$

Expressed as a decimal, the annual interest rate is 0.0625.

Simple Interest vs. Compound Interest

Before calculating, it's vital to determine whether the interest is simple or compound, as the formulas differ.

Simple Interest (SI):

Interest is calculated only on the principal amount, not on accumulated interest. The formula:

$$SI = P \times r \times t$$

Where:

- P = principal
- r = annual interest rate (decimal)
- t = time in years

Compound Interest (CI):

Interest is calculated on the principal plus accumulated interest from previous periods. The formula:

$$A = P \times (1 + r)^t$$

Where:

- A = final amount
- P = principal
- r = annual interest rate (decimal)
- t = time in years

Assumption:

In most standard bank savings scenarios, interest may be compounded annually unless specified otherwise. Since the problem does not specify the type, we will examine both simple and compound interest calculations.

Calculating Using Simple Interest

Step 1: Plug the values into the simple interest formula:

$$SI = 3000 \times 0.0625 \times 2$$

Step 2: Compute the interest:

$$[SI = 3000 \times 0.125 = 375]$$

Step 3: Find the total amount:

$$[A = P + SI = 3000 + 375 = \boxed{\text{₹}3,375}]$$

Result:

If the interest is simple, after 2 years, the total amount in the account will be ₹3,375.

Calculating Using Compound Interest

Step 1: Use the compound interest formula:

$$[A = 3000 \times (1 + 0.0625)^2]$$

Step 2: Calculate $(1 + 0.0625)^2$:

$$[(1.0625)^2 = 1.0625 \times 1.0625]$$

Calculating:

$$[1.0625 \times 1.0625 = 1.12890625]$$

Step 3: Multiply by the principal:

$$[A = 3000 \times 1.12890625 = \boxed{\text{₹}3,386.72}]$$

Result:

Assuming the bank compounds interest annually, the amount after 2 years will be approximately ₹3,386.72.

Comparing the Results

Calculation Type	Final Amount (₹)	Difference (₹)
Simple Interest	3,375	—
Compound Interest	3,386.72	11.72

The difference of approximately ₹11.72 illustrates how compound interest slightly outperforms simple interest over time, especially as the period extends.

Additional Factors to Consider

While the calculations above provide a clear picture, several other factors influence the actual amount received from a bank:

- Interest Payment Frequency:

If interest is compounded more frequently (semi-annually, quarterly, monthly), the final amount increases slightly.

- Bank Policies:

Some banks may have different interest calculation methods, fees, or minimum deposit requirements that impact returns.

- Taxation:

Depending on jurisdiction, interest earned may be taxable, reducing the net amount.

- Inflation Rate:

Over time, inflation affects the real value of your savings.

Practical Implications for Savers

Understanding how interest works helps individuals make informed decisions about where to save or invest. Here are some practical tips:

- Compare Interest Rates:

Higher rates yield better returns, but always consider the compounding frequency.

- Know the Type of Interest:

Clarify whether the bank offers simple or compound interest.

- Consider the Investment Duration:

Longer periods typically benefit more from compounding.

- Account for Taxes and Fees:

These can diminish the actual returns.

- Plan for Inflation:

Ensure the interest rate exceeds inflation to preserve or grow purchasing power.

Conclusion

Depositing ₦3,000 in a bank for two years at an annual interest rate of 6 1/4% can lead to modest growth of your savings, with the exact amount depending on the interest calculation method. Under simple interest, the total would be ₦3,375, whereas with annual compounding, it would be approximately ₦3,386.72. Recognizing the differences between these calculations empowers savers to better evaluate their options and make choices aligned with their financial goals. Whether you are saving for future needs or planning investments, understanding the mechanics behind interest accumulation is essential for maximizing your financial growth.

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