10 Banks and Simple Interest

Let's recall.

A bank is a government recognized institution that carries out transactions of money. Banks make it easier to plan the use of money, i.e., to do financial planning. We can either deposit cash money in a bank or withdraw cash from it. For that purpose, we must open an account in a bank. Bank accounts are of various kinds.

Let's learn. **Different Types of Accounts**

✸ Current Account

A current account is mainly for traders and those dealing in money on a daily basis. An account holder can deposit or withdraw money any number of times in a day. The bank issues a passbook for this account and also a cheque book on demand. The bank does not pay any interest on the money in this type of account. Money can also be withdrawn or deposited by cheque.

✸ Savings Account

A person can deposit a minimum amount and open a savings account. In some banks, no minimum amount is required for opening an account. The bank pays some interest on the basis of the daily credit balance in the account. There are some restrictions on how often money can be withdrawn from this account. For this account too, the bank issues a passbook and, on demand, a cheque book.

✸ Recurring Deposit Account

The account holder can decide the amount to be deposited every month in the account. The bank gives an interest on the deposit which is more than that paid for the savings account. Such an account is a means of compulsory savings.

Often it is convenient to have a joint account for say, husband and wife or guardian and ward, etc. Besides, accounts of business partners, housing societies, trusts of voluntary agencies, etc. are required to be operated by more than one person.

✸ Fixed Deposit

A depositor deposits a certain amount for a fixed period in the bank. This deposit attracts a greater rate of interest than the savings account. However, these rates are different in different banks. Senior citizens get a slightly greater rate of interest than the usual.

ATM, credit and debit cards : An ATM (Automatic Teller Machine) card is used to withdraw cash without going to a bank. A credit card or debit card is used to carry out transactions without using cash. An account holder can get such a card on request to the bank.

Let's discuss.

Have you seen a bank passbook?

Observe the entries made in the page of a passbook shown below:

ओळ क्र. पंक्ति क्र. LINE NO.	तारीख दिनांक DATE	तपशील ब्यौरा PARTICULARS	चेक क्रमांक चेक क्रमांक CHEQUE No.	रक्कम काढली निकाली गई रकम AMOUNT WITHDRAWN	रक्कम ठेवली जमा की गई रकम AMOUNT DEPOSITED	शिल्लक बाकी जमा BALANCE
1.	2.2.2016	cash			1500.00	7000.00
2.	8.2.2016	cheque	232069		5000.00	12000.00
3.	12.2.2016	cheque	243965	3000.00		9000.00
4.	15.2.2016	self		1500.00		7500.00
5.	26.2.2016	interest			135.00	7635.00

- On 2.2.16 the amount deposited was ☐ rupees and the balance ☐ rupees.
- On 12.2.16 ☐ rupees were withdrawn by cheque no. 243965. The balance was ☐ rupees.
- On 26.2.2016 the bank paid an interest of ☐ rupees.

A passbook is issued for a savings account and a recurring deposit account. Amounts deposited, withdrawn and the balance are recorded in it with their dates.

Activity: Ask an adult in your house to show you a passbook and explain the entries made in it.

Let's recall.

Suvidya borrowed a sum of 30000 rupees at 8 p.c.p.a. interest for a year from her bank to buy a computer. At the end of the period, she had to pay back an amount of 2400 rupees over and above what she had borrowed.

- Based on this information fill in the boxes below.

Principal = ₹ ☐, Rate of interest = ☐ %, Interest = ₹ ☐, Time = ☐ years.

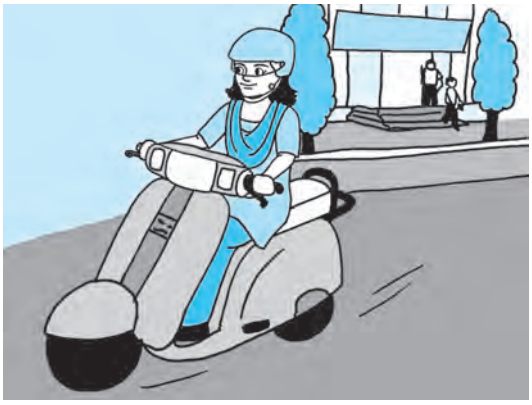
The total amount returned to the bank = 30,000 + 2,400 = ☐

Let's learn.

We added the capital and the interest accrued on it to find out the amount that Suvidya returned to the bank. Thus,

Principal + Interest = Amount

Example Neha took a loan of 50000 rupees at 12 p.c.p.a. to buy a two wheeler. What amount will she return to the bank at the end of one year?



Solution : The amount, that is, the total money owed to the bank at the end of the time, is to be calculated here. The principal is 50000 rupees. At 12 p.c.p.a., the interest on 100 rupees for one year is 12 rupees. We shall write the ratio of interest to capital in two ways to obtain an equation.

On 50000 rupees let the interest be x rupees.
On 100 rupees the interest is 12 rupees.

$$\frac{x}{50000} = \frac{12}{100}$$

$$\frac{x}{50000} \times 50{,}000 = \frac{12}{100} \times 50{,}000 \qquad \text{(Multiplying both sides by 50000)}$$

$$x = 6000$$

Amount (to be returned to the bank) = principal + interest

= 50,000 + 6,000

$\therefore$ Amount to be returned to the bank = ₹ 56,000

Example Aakash deposited 25000 rupees in a bank at a rate of 8 p.c.p.a.for 3 years. How much interest does he get every year? How much, altogether?

Solution : Here, the principal is 25000 rupees, time is 3 years and rate of interest is 8 on 100 rupees. The interest on 100 rupees is 8 rupees. Let us suppose the interest on 25000 rupees for 1 year is x. Let us find the ratio of interest to principal. Then,

$$\frac{x}{25000} = \frac{8}{100}$$

$$\therefore \frac{x}{25000} \times 25000 = \frac{8}{100} \times 25000 \qquad \text{(Multiplying both sides by 25000)}$$

$$\therefore \quad x = 2000$$

Aakash got 2000 rupees interest for one year.

For three years he got = 2000 × 3 = 6000 rupees interest.

Let's learn.

Let's learn the formula used to solve problems based on simple interest.

The principal is the same every year and the rate of interest too remains the same. The interest calculated in this way is called simple interest. Let us calculate the total interest when the principal P is deposited for T years at R rate of interest. Suppose the interest for one year is I.

The ratio of interest to principal for one year:

$$\frac{I}{P} = \frac{R}{100} \qquad \therefore I = \frac{P \times R}{100}$$

$$\text{Interest for T years} = I \times T = \frac{P \times R \times T}{100}$$

$$\therefore \text{Total interest } I = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

Solving the same example using the formula:

Principal = P = 25000, R = 8, T = 3

$$\text{Total interest} = \frac{P \times R \times T}{100}$$

$$= \frac{25000 \times 8 \times 3}{100}$$

$$= 6000$$

$\therefore$ Total interest is 6000 rupees.

Now I know!

Total interest $I = \frac{P \times T \times R}{100}$ where P = principal, T = time in years, R = rate of interest

Example Sandeepbhau borrowed 120000 rupees from a bank for 4 years at the rate of $8\frac{1}{2}$ p.c.p.a. for his son's education. What is the total amount he returned to the bank at the end of that period ?

Solution : Principal = 120000, P = 120000, R = 8.5, T = 4

$$\therefore \text{Total interest} = \frac{P \times R \times T}{100} = \frac{120000 \times 8.5 \times 4}{100}$$

$$= \frac{120000 \times 85 \times 4}{100 \times 10}$$

$$= 120 \times 85 \times 4$$

$$= 40800$$

The total amount returned to the bank = 120000 + 40800 = 160800 rupees.

Practice Set 40

1. If Rihanna deposits 1500 rupees in the school fund at 9 p.c.p.a for 2 years, what is the total amount she will get?
2. Jethalal took a housing loan of 2,50,000 rupees from a bank at 10 p.c.p.a. for 5 years. What is the yearly interest he must pay and the total amount he returns to the bank?

3*. Shrikant deposited 85,000 rupees for $2\frac{1}{2}$ years at 7 p.c.p.a. in a savings bank account. What is the total interest he received at the end of the period?

4. At a certain rate of interest, the interest after 4 years on 5000 rupees principal is 1200 rupees. What would be the interest on 15000 rupees at the same rate of interest for the same period?
5. If Pankaj deposits 1,50,000 rupees in a bank at 10 p.c.p.a. for two years, what is the total amount he will get from the bank?

Let's learn.

When three of the four quantities, principal, time, rate and amount are given, to find the fourth: In the formula, we place any letter in place of the unknown quantity and solve the equation thus obtained to find the answer.

Example Principal = 25000 rupees, Amount = 31,000 rupees, Time = 4 years, what is the rate of interest?

Here, Amount − Principal = Total interest

31000 − 25000 = 6000

Principal = 25000 rupees, time = 4 years, interest = 6000 rupees

Let us now use the formula.

$$\text{Simple interest} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$$\text{Then, } 6000 = \frac{25000 \times R \times 4}{100} \qquad \text{where R = rate of interest}$$

$$R = \frac{6000 \times 100}{25000 \times 4}$$

$$\therefore R = 6$$

$\therefore$ Rate of interest is 6 p.c.p.a

Example Unmesh borrowed some money for 5 years at simple interest. The rate of interest is 9 p.c.p.a. If he returned 17400 rupees altogether at the end of 5 years, how much had he borrowed?

$$\text{Interest} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

This formula cannot be used directly to solve the problem because we do not

know either interest or principal. However, the interest on a principal of 100 rupees for 5 years is 45 rupees. Hence, the amount is 100+45=145 rupees. Now we can express the ratio of principal and amount in two ways and obtain an equation.

If Unmesh's principal is P then $\frac{P}{17400} = \frac{100}{145}$

$$\therefore P = \frac{100 \times 17400}{145} = 12000$$

$\therefore$ The principal that Unmesh borrowed was 12000 rupees.

Let's discuss.

- Can we solve the problem by using the formula to obtain a different kind of equation?

Practice Set 41

1. If the interest on 1700 rupees is 340 rupees for 2 years the rate of interest must be ..... .
   (i) 12 % (ii) 15 % (iii) 4 % (iv) 10 %
2. If the interest on 3000 rupees is 600 rupees at a certain rate for a certain number of years, what would the interest be on 1500 rupees under the same conditions ?
   (i) 300 rupees (ii) 1000 rupees (iii) 700 rupees (iv) 500 rupees
3. Javed deposited 12000 rupees at 9 p.c.p.a. in a bank for some years, and withdrew his interest every year. At the end of the period, he had received altogether 17,400 rupees. For how many years had he deposited his money ?

4*. Lataben borrowed some money from a bank at a rate of 10 p.c.p.a. interest for $2\frac{1}{2}$ years to start a cottage industry. If she paid 10250 rupees as total interest, how much money had she borrowed ?

5. Fill in the blanks in the table.

	Principal	Rate of interest (p.c.p.a.)	Time	Interest	Amount
(i)	4200	7%	3 years	.....	.....
(ii)	.....	6%	4 years	1200	.....
(iii)	8000	5%	.....	800	.....
(iv)	.....	5%	.....	6000	18000
(v)	.....	$2\frac{1}{2}$ %	5 years	2400	.....

Activity :
- Visit different banks and find out the rates of the interest they give for different types of accounts.
- With the help of your teachers, start a Savings Bank in your school and open an account in it to save up some money.