

Simple and Compound Interest

The **interest** you earn on your checking or savings accounts is determined by the **interest rate** expressed as an annual (yearly) percent, the **principal**, or amount of money in your account, and the length of **time** (in years) the money is used.

Simple interest is computed by using this formula.

$$\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time, or } I = p \times r \times t$$

When finding the simple interest, the interest is always based on the original principal.

Example 1: You deposit \$400 in a savings account that pays 1.75% interest per year. How much interest will you earn in 3 months? How much will then be in your account?

THINK: Principal: \$400 Rate: 1.75% = 0.0175 Time: 3 mo = $\frac{1}{4}y = 0.25y$

Step 1 Multiply to find the interest earned.

$$I = p \times r \times t$$

$$I = \$400 \times 0.0175 \times 0.25$$

$$I = \$1.75$$

You will earn \$1.75 in interest.

Step 2 Add to find the new balance.

$$\$400 + \$1.75 = \$401.75$$

At the end of 3 months, you will have \$401.75 in your account.

For longer periods of time, banks **compound** your interest. They periodically add the interest to your account and compute interest in successive periods on each new higher principal.

Example 2: Jeff deposits \$800.00 in a savings account that pays 2% interest compounded quarterly. How much will be in the account at the end of 1 year? How much interest will he earn in 1 year?

THINK: Principal: \$800 Rate: 2% = 0.02 Time: each $\frac{1}{4}y = 0.25y$

Step 1 Compute 1st-quarter interest and the new balance (principal).

$$\$800.00 \times 0.02 \times 0.25 = \$4.00$$

$$\$800.00 + \$4.00 = \$804.00$$

Step 2 Compute 2nd-quarter interest and the new balance (principal).

$$\$804.00 \times 0.02 \times 0.25 = \$4.02$$

$$\$804.00 + \$4.02 = \$808.02$$

Step 3 Compute 3rd-quarter interest and the new balance (principal).

$$\$808.02 \times 0.02 \times 0.25 = \$4.04$$

$$\$808.02 + \$4.04 = \$812.06$$

Step 4 Compute 4th-quarter interest and the new balance (principal).

$$\$812.06 \times 0.02 \times 0.25 = \$4.06$$

$$\$812.06 + \$4.06 = \$816.12$$

At the end of 1 year, Jeff's new savings account balance will be \$816.12.

Step 5 Subtract to find the interest.

$$\$816.12 - \$800.00 = \$16.12$$

Jeff will earn \$16.12 in interest.

Name _____ Date _____

Banks use a compound interest table to compute compound interest.

Example 3: Delia deposits \$2,000 in a savings account that pays 2% interest compounded quarterly. How much will she have at the end of 3 years?

THINK: 4 quarters per year means 12 quarters in 3 years.

2% annual interest is equal to 0.5% interest per quarter.

Step 1 Use the table below to find the compounded value of \$1.00

\$1.00 at 0.5% for 12 periods will grow to \$1.0617.

Step 2 Multiply to find the new balance (principal).

$\$2,000 \times \$1.0617 = \$2,123.40$

At the end of 3 years, Delia will have \$2,123.40.

Compound Interest Table

No. of Periods	0.5%	1%	1.5%	2%	2.5%	3%	3.5%	4%
1	1.0050	1.0100	1.0150	1.0200	1.0250	1.0300	1.0350	1.0400
2	1.0100	1.0201	1.0302	1.0404	1.0506	1.0609	1.0712	1.0816
3	1.0151	1.0303	1.0457	1.0612	1.0769	1.0927	1.1087	1.1248
4	1.0202	1.0406	1.0614	1.0824	1.1038	1.1255	1.1475	1.1699
5	1.0253	1.0510	1.0773	1.1041	1.1314	1.1593	1.1877	1.2167
6	1.0304	1.0615	1.0934	1.1262	1.1597	1.1941	1.2293	1.2650
7	1.0355	1.0721	1.1098	1.1487	1.1887	1.2299	1.2723	1.3159
8	1.0407	1.0829	1.1265	1.1717	1.2184	1.2668	1.3168	1.3686
9	1.0459	1.0937	1.1434	1.1951	1.2489	1.3048	1.3629	1.4233
10	1.0511	1.1046	1.1605	1.2190	1.2801	1.3439	1.4106	1.4802
11	1.0564	1.1157	1.1779	1.2434	1.3121	1.3842	1.4600	1.5395
12	1.0617	1.1268	1.1956	1.2682	1.3449	1.4258	1.5111	1.6010
13	1.0670	1.1381	1.2136	1.2936	1.3785	1.4685	1.5640	1.6651
14	1.0723	1.1495	1.2318	1.3195	1.4130	1.5126	1.6187	1.7317
15	1.0777	1.1610	1.2502	1.3459	1.4483	1.5580	1.6753	1.8009
16	1.0831	1.1726	1.2690	1.3728	1.4845	1.6047	1.7340	1.8730
17	1.0885	1.1843	1.2880	1.4002	1.5216	1.6528	1.7947	1.9479
18	1.0939	1.1961	1.3073	1.4282	1.5597	1.7024	1.8575	2.0258
19	1.0994	1.2081	1.3270	1.4568	1.5987	1.7535	1.9225	2.1068
20	1.1049	1.2202	1.3469	1.4859	1.6386	1.8061	1.9898	2.1911
21	1.1104	1.2324	1.3671	1.5157	1.6796	1.8603	2.0594	2.2788
22	1.1160	1.2447	1.3876	1.5460	1.7216	1.9161	2.1315	2.3699
23	1.1216	1.2572	1.4084	1.5769	1.7646	1.9736	2.2061	2.4647
24	1.1272	1.2697	1.4295	1.6084	1.8087	2.0328	2.2833	2.5637
25	1.1328	1.2824	1.4509	1.6407	1.8539	2.0938	2.3673	2.6650

Name _____ Date _____

Think About It

1. Which earns more in a year, an account with interest compounded quarterly or the same account compounded daily? Why?

2. Why do banks pay you less interest than they earn on your money?

Practice

Remember to estimate whenever you use your calculator.

Compute the simple interest earned and the new balance (principal).

Principal	Rate	Time	Interest; New Balance
\$250	2%	4 y	1. _____; _____
\$500	$1\frac{1}{2}\%$	3 y	2. _____; _____
\$1,250	$2\frac{1}{2}\%$	2 y	3. _____; _____
\$8,020	3%	8 y	4. _____; _____
\$3,500	$1\frac{1}{2}\%$	7 y	5. _____; _____
\$850	$2\frac{1}{2}\%$	10 y	6. _____; _____
\$2,630	$2\frac{1}{4}\%$	3 y	7. _____; _____
\$5,875	$1\frac{3}{4}\%$	5 y	8. _____; _____

Name _____ Date _____

Compute the new balance (principal) and the compound interest earned.

Principal	Rate	Time	Interest; New Balance
\$1,000	2% compounded semiannually	1 y	9. _____; _____
\$5,000	$1\frac{3}{4}\%$ compounded semiannually	2 y	10. _____; _____
\$400	$2\frac{1}{2}\%$ compounded quarterly	1 y	11. _____; _____
\$7,500	$1\frac{1}{2}\%$ compounded quarterly	18 mo	12. _____; _____

Use the compound interest table to find the new balance (principal).

Principal	Rate	Time	New Balance
\$4,000	2% compounded annually	5 y	13. _____
\$6,500	3% compounded semiannually	2 y	14. _____
\$10,000	2% compounded quarterly	4 y	15. _____
\$3,200	4% compounded quarterly	6 y	16. _____

Name _____ Date _____

Attention

Money Market and NOW Accounts

Banks offer special checking accounts that allow you to earn interest. Most NOW and Money Market accounts require that you keep a minimum balance, such as \$2,000 or \$2,500. Interest is usually compounded daily and paid monthly on the basis of your average daily balance.

1. How do NOW and Money Market accounts differ from regular checking accounts?

2. If your $2\frac{1}{2}\%$ NOW account has an average daily balance of \$2,500 over the course of a year, about how much interest would you earn? _____

Practice

Simple and Compound Interest

Compute the simple interest earned and the new balance (principal). Remember to estimate whenever you use your calculator.

Principal	Rate	Time	Simple Interest	New Balance
\$350	6%	3 y	1. _____	2. _____
\$600	5%	4 y	3. _____	4. _____
\$1,250	7%	5 y	5. _____	6. _____
\$4,050	6%	4 y	7. _____	8. _____
\$6,550	8%	6 y	9. _____	10. _____
\$2,550	$5\frac{1}{2}\%$	5 y	11. _____	12. _____
\$950	$7\frac{1}{2}\%$	10 y	13. _____	14. _____

Name _____ Date _____

Compute the new balance (principal) and the compound interest earned.

Principal	Rate	Time	New Balance	Compound Interest
\$2,000	6% compounded semiannually	1 y	15. _____	16. _____
\$4,000	5 $\frac{1}{4}$ % compounded semiannually	2 y	17. _____	18. _____
\$500	7% compounded quarterly	1 y	19. _____	20. _____
\$6,500	6 $\frac{1}{2}$ % compounded quarterly	1 y	21. _____	22. _____
\$3,500	5 $\frac{3}{4}$ % compounded quarterly	18 mo	23. _____	24. _____
\$7,000	5% compounded semiannually	1 y	25. _____	26. _____

Use the compound interest table on page 58 to find the new balance (principal).

Principal	Rate	Time	New Balance
\$5,000	8% compounded semiannually	4 y	27. _____
\$4,500	6% compounded semiannually	5 y	28. _____
\$12,000	7% compounded semiannually	7 y	29. _____
\$3,300	10% compounded quarterly	6 y	30. _____
\$10,000	8% compounded quarterly	5 y	31. _____
\$8,500	6% compounded quarterly	4 y	32. _____

17-20: See student's check registers.

- 17. \$386.16
- 18. \$267.06
- 19. \$235.82
- 20. \$570.97
- 21. \$69.06
- 22. \$221.13

Pages 46-48

Think About It

1. Cancelled checks serve as records of checking account transactions. They could also be needed for tax purposes.
2. Sometimes you have to maintain a certain minimum balance, or else there is a service charge.

Practice

- 1. \$415.09
- 2. \$399.99
- 3. 685
- 4. \$19.85
- 5. \$4.75
- 6. \$395.24
- 7. \$476.20
- 8. \$550.43
- 9. \$154.85
- 10. \$247.30
- 11. \$529.79
- 12. \$471.82
- 13. \$521.18
- 14. \$511.08
- 15. 476
- 16. \$15.60
- 17. \$5.50
- 18. \$505.58

Page 50

Problem Solving Application

- 1. 425.85
- 2. 370.60
- 3. 350.85
- 4. 401.70
- 5. 236.38
- 6. \$417.15

Pages 53-56

Think About It

1. Savings accounts are for accumulating money while checking accounts are for spending money conveniently.
2. Interest is the cost of using money. The bank makes money by lending your money out at a higher interest rate than it pays you.

Practice

1-8: See student's deposit slips.

- 1. \$128.29
- 2. \$202.08
- 3. \$272.79
- 4. \$716.15
- 5. \$199.65
- 6. \$333.59
- 7. \$248.94
- 8. \$822.46

9-12: Check completed withdrawal slips.

- 13. \$188.57
- 14. \$41.95
- 15. \$517.12
- 16. \$38.69
- 17. \$2,223.92
- 18. \$222.31
- 19. \$128.85
- 20. \$83.85
- 21. \$66.35
- 22. \$142.71

- 23. \$143.76
- 24. \$79.76
- 25. \$95.60
- 26. \$174.74
- 27. \$59.23
- 28. \$672.68
- 29. \$57.83
- 30. \$840.87
- 31. \$171.89
- 32. \$96.89
- 33. \$120.56
- 34. \$166.06
- 35. \$111.06
- 36. \$113.54
- 37. \$115.06
- 38. \$166.28
- 39. \$495.41

- 40. \$220.09
- 41. \$652.93
- 42. \$1,962.98
- 43. \$550.82
- 44. \$515.82
- 45. \$465.82
- 46. \$671.32
- 47. \$847.20
- 48. \$747.20
- 49. \$807.65

Pages 59-62

Think About It

1. Compounded daily earns more in a year, because principal grows each day, not just once a quarter.
2. Banks profit from the use of your money.

Practice

- 1. \$20; \$270
- 2. \$22.50; \$522.50
- 3. \$62.50; \$1,312.50
- 4. \$1,924.80; \$9,944.80

Simple +
Compound
Interest
Answers

Simple + Compound Interest Answers Cont.

5. \$367.50; \$3,867.50
6. \$212.50; \$1,062.50
7. \$177.53; \$2,807.53
8. \$514.06; \$6,389.06
9. \$20.10; \$1,020.10
0. \$177.31; \$5,177.31
11. \$10.09; \$410.09
12. \$170.34; \$7,670.34
13. \$4,416.40
14. \$6,899.10
15. \$10,831.00
16. \$4,063.04

Extension

1. They pay interest.
They require a minimum balance.
2. \$62.50

Practice

1. \$63
2. \$413
3. \$120
4. \$720
5. \$437.50
6. \$1,687.50
7. \$972
8. \$5,022
9. \$3,144
10. \$9,694
11. \$701.25
12. \$3,251.25
13. \$712.50
14. \$1,662.50
15. \$2,121.80
16. \$121.80
17. \$4,436.83
18. \$436.83
19. \$535.93
20. \$35.93
21. \$6,932.91
22. \$432.91

23. \$3,812.93
24. \$312.93
25. \$7,354.38
26. \$354.38
27. \$6,843.00
28. \$6,047.55
29. \$19,424.40
30. \$5,968.71
31. \$14,859.00
32. \$10,786.50

Pages 63-66

Think About It

1. Banks seek additional accounts because they can invest the money in loans and other types of investments.

Practice

1. \$60
2. \$112
3. \$54
4. \$250
5. \$562.50
6. \$350
7. \$371.25
8. \$5.00
9. \$2,000
10. \$96.25
11. \$6,000
12. \$4,851
13. \$56.25
14. \$562.50
15. \$5,625
16. \$56,250
17. \$3,744
18. \$10.36
19. \$1,776.25
20. \$217.81
21. \$515.15
22. \$520.30
23. \$525.50

24. \$530.76
25. \$5,151.69
26. \$303.01

Pages 68-70

Decision Making

1. \$1,000
2. None
3. \$2,000
4. \$5.00
5. \$7.50
6. \$7.50
7. 25¢
8. 20¢
9. 25¢
10. No
11. Yes; 2%
12. No
13. Money Market
14. Regular
15. Value
16. NOW
17. \$8.00; \$96.00
18. \$0
19. \$11.25
20. No; interest = \$60, fee = \$96
21. Answers may vary.
22. Answers may vary.
23. \$5
24. \$1,500
25. 5 withdrawals per month
26. $1\frac{1}{2}\%$
27. None
28. \$3 per month if balance falls below \$1,500
29. Regular savings
30. Money-market savings
31. Regular savings
32. Money Market savings
33. \$100
34. Answers may vary.