

Facts to Know

When money is borrowed, you must pay to use it because someone else is losing an opportunity to use it while you have it. What you pay to use the money is called *interest*. The rate of interest is a percent. The money you borrow is called the *principal*. Simple interest is paid only on the principal.

The Interest Formula

To calculate the amount of simple interest on a loan, use this formula:

$$\text{Interest} = \text{Principal} \times \text{Rate of Interest} \times \text{Time (or)} \quad \mathbf{I = PRT}$$

Rate of Interest

The rate of interest is always given as a percent. You often see rates of interest on loans and investments posted outside of banks.

Time

Time in connection with loans is always expressed in years or parts of a year.

$$1 \text{ month} = \frac{1}{12} \text{ of a year}$$

$$6 \text{ months} = \frac{6}{12} \text{ or } \frac{1}{2} \text{ year}$$

Calculating Interest

To find simple interest, use the formula $\mathbf{I = PRT}$

Sample: How much would a loan of \$500 be at 6% interest for 6 months?

Step 1 → Use the interest formula. The formula to calculate interest is this:

$$\text{Interest} = \text{Principal} \times \text{Rate of Interest} \times \text{Time (I = P x R x T)}$$

Step 2 → Change the rate, given as a percent, to a fraction and reduce. Set up time as a fraction of a year.

$$R = \frac{6}{100} = \frac{3}{50}$$

$$T = \frac{6}{12} = \frac{1}{2}$$

Step 3 → Multiply *principal* x *rate* x *time*. Cancel where possible.

$$I = \frac{\overset{5}{\cancel{500}}}{\underset{1}{1}} \times \frac{\overset{3}{\cancel{50}}}{\underset{1}{1}} \times \frac{\overset{1}{\cancel{2}}}{\underset{1}{1}} = \$15$$

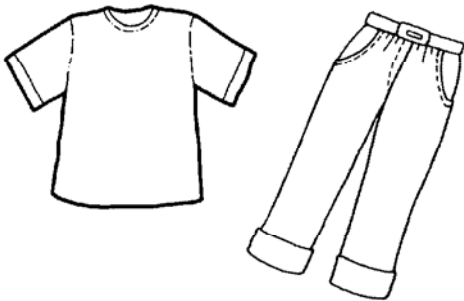
You can also change the percent to a decimal (6% = .06) and the time to a decimal (6 months = $\frac{6}{12} = .5$) and then multiply.

$$\mathbf{I = \$500.00 \times .06 \times .5 = \$15}$$

Facts to Know (cont.)

Calculating Interest (cont.)

Sample: A T-shirt costs \$24.99 and a pair of jeans costs \$34.99. Each is on sale for 25% off the original price. If Jenna bought the T-shirt and jeans while they were on sale, what was her total price before adding tax? What is the total amount that Jenna had to pay for her purchase after tax was added? (Tax is 8%.)



$$\begin{array}{r} \$24.99 \text{ original T-shirt price} \\ \times 0.25 \text{ discount} \\ \hline \$6.2475 = \$6.25 \text{ (rounded to the nearest hundredth)} \end{array}$$

$$\begin{array}{r} \$24.99 \\ - \$6.25 \\ \hline \$18.74 \text{ sale price for T-shirt} \end{array}$$

$$\begin{array}{r} \$34.99 \text{ original jeans price} \\ \times 0.25 \text{ discount} \\ \hline \$8.7475 = \$8.75 \text{ (rounded to the nearest hundredth)} \end{array}$$

$$\begin{array}{r} \$34.99 \\ - \$8.75 \\ \hline \$26.24 \text{ sale price for jeans} \end{array}$$

Jenna paid $\$18.74 + \$26.24 = \$44.98$ for the T-shirt and jeans.

Discounts and Sales

A *discount* is used by manufacturers and merchants to mean taking off a certain percentage of the price given in a price list. This price is called the *list price*. The list price less the discount is known as the *net price*. The noun “discount” can be used as a verb, too—“We’re discounting by 15% the list price on all new cars and trucks during our storewide ‘Get into Spring’ sale!”

You would ask “What’s the discount?” but not, “What’s the sale?” Often you have to figure out your own savings during a sale, and this is where understanding decimals and percents comes in handy.

Let’s say, for instance, you read that a local amusement park is offering a single, one-day pass to all rides for \$12.50, or a special two-day pass for \$20.00. You do some quick decimal arithmetic.

$$\begin{array}{r} \$12.50 \\ \times 2 \text{ one-day pass} \\ \hline \$25.00 \end{array}$$

So your savings on a two day pass is the following:

$$\begin{array}{r} \$25.00 \text{ one-day pass} \\ - \$20.00 \text{ two-day pass} \\ \hline \$5.00 \end{array}$$

But, just curious—what percent off is that?

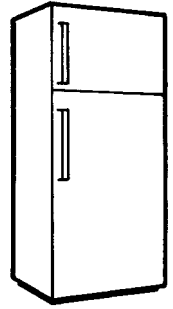
$$\frac{\$5.00}{\$25.00} = \frac{x}{100} \rightarrow \text{invert and multiply } \frac{\$5.00}{\$25.00} \times \frac{100}{x} = \frac{500}{25} \text{ or } 20\% \text{ off}$$

Directions: Calculate the simple interest.

Cost: \$500.00

Annual Rate of Interest: 9%

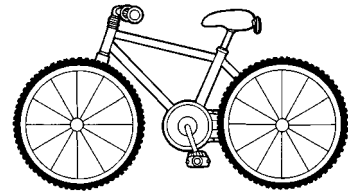
- Interest paid annually _____
- 12 equal payments to pay the loan plus the interest _____



Cost: \$160.00

Bi-annual Rate of Interest: 12.5%

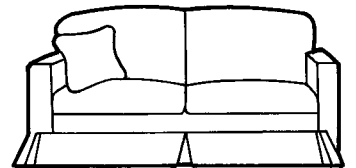
- Interest paid in six months _____
- 6 equal payments to pay the loan plus the interest _____



Cost: \$750.00

Annual Rate of Interest: 18%

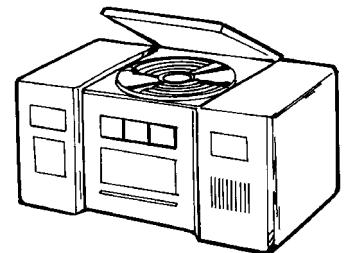
- Interest paid in one year _____
- 12 equal payments to pay the loan plus the interest _____



Cost: \$199.00

Annual Rate of Interest: 5%

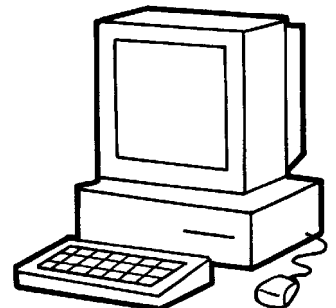
- Interest paid over two years _____
- 24 equal payments to pay the loan plus the interest _____



Cost: \$1,000.00

Annual Rate of Interest: 14.9%

- Interest paid over two years _____
- 24 equal payments to pay the loan plus the interest _____



Calculating Fractions, Decimals, and Percents

Directions: Some states require that out-of-state businesses pay a shipping tax to send goods to state residents. Refer to this table to do the problems below. (**Note:** The shipping rates do not reflect the actual current rates.)

Some States' Shipping Taxes

Alabama	AL	8.00%
Maryland	MD	5.75%
Georgia	GA	4.00%
Illinois	IL	2.00%
Indiana	IN	5.00%
Kentucky	KY	6.00%
Missouri	MO	5.725%

- Miguel lives in Maryland and purchased a sweater for \$39.99 from a catalog. Add the shipping tax. What's the total cost of the sweater? _____
- Mr. and Mrs. Wong paid a total of \$200.00 for an entertainment center for their home in Chicago, Illinois. The salesperson said that there was already a 2% shipping tax already added to the final price. What was the price of the entertainment center before the tax was added? _____
- Stuart lives in Alabama and recently joined a book club that will send a book to him every month. The books are \$15.00 each. The book club billing will include the shipping tax. What is the total amount that Stuart will have to pay for each book? _____
- The Middlebury High School band in Indiana is going to sell holiday ornaments to raise money for uniforms. Each ornament will cost \$5.00. How much is the shipping price per ornament? _____
- The Williams family live in Lexington, Kentucky. They recently purchased a computer for \$1,295.00. What is the total price for the computer after the shipping tax was added? _____

Directions: Complete the table below.

	Fraction	Decimal	Percent
1.	$\frac{1}{10}$		
2.		.25	
3.			45%
4.			15%
5.	$\frac{4}{5}$		
6.	$\frac{5}{6}$		
7.		.77	
8.	$\frac{1}{20}$		
9.		.222	
10.			40%

20. 0.15; 0.51; 5.01;
50.1
21. 4
22. 27
23. 21
24. 5.6
25. 0.2
26. 7.6
27. 18.7
28. 304.81
29. 1.06
30. 27.39
31. 356.14
32. \$13.02
33. \$163.76
34. 4,567.83

Page 27

1. 2.7
2. .14
3. 4.338
4. 1825.2
5. 4121
6. 6
7. 150.9
8. 10.625
9. 1.628
10. 31.88
11. .056
12. .00702
13. .084
14. 599.104
15. 161.505
16. 2.16408
17. 56.088
18. 48.708
19. 7.616
20. .18446
21. 1.8
22. 53
23. 145
24. .091
25. 112.34
26. .922
27. 524.75
28. 893,155
29. 0.23
30. 1679.45

Page 28

1. \$93.96
2. \$4.47
3. \$105.30
4. \$69.93
5. \$53.38
6. \$420.52

7. \$585.39
8. \$256.50
9. 2.646
10. 1.872
11. 2.6628
12. 0.00228
13. \$6.30
14. 4.78
15. 137.74
16. \$1.38
17. \$8.37
18. .1218

Page 32

1. 5
2. 0.139
3. 10.80
4. 625
5. 0.013
6. 0.04
7. 0.03
8. 750
9. 175
10. \$81.25
11. 5.7
12. .043
13. 4.9
14. 80
15. 50
16. 7/20
17. 8/125
18. 3 2/5
19. 3 1/8
20. 18 1/3
21. 4 5/8
22. 21/2500
23. 66 3/4
24. 159/500
25. 1/16
26. 4 1/4
27. 1 1/10
28. .8
29. .37 1/2 or .375
30. .66 2/3
31. .77 7/9
32. .83 1/3
33. .62 1/2 or .625
34. .33 1/3
35. .7

Page 36

1. 7%
2. 75%
3. 3.5%
4. 33 1/3%

5. 90%
6. 150%
7. .4%
8. 65%
9. 10%
10. 66 2/3%
11. .09
12. .35
13. .048
14. .22 2/9
15. .6
16. 1.25
17. .003
18. .95
19. .2
20. .33 1/3
21. 3/4
22. 2/5
23. 1/20
24. 4/5
25. 3/50
26. 9/100
27. 2/25
28. 1/5
29. 7/20
30. 43/50
31. 37.5%
32. 33 1/3%
33. 40%
34. 87.5%
35. 66 2/3%
36. 20%
37. 50%
38. 12.5%
39. 5%
40. 25%
41. 5%
42. 600%
43. 20%
44. 16 2/3%
45. 25%
46. 80
47. 90
48. 63.6
49. 130
50. 85.71

Page 39

1. \$45.00
2. \$45.42
3. \$10.00
4. \$30.00
5. \$135.00
6. \$73.75

7. \$19.90
8. \$9.12
9. \$298
10. \$54.08

Page 40

1. \$42.29
2. \$196
3. \$16.20
4. \$0.25
5. \$1372.70

Chart

1. $\frac{1}{10}$, .10, 10%
2. $\frac{1}{4}$, .25, 25%
3. $\frac{9}{20}$, .45, 45%
4. $\frac{3}{20}$, .15, 15%
5. $\frac{4}{5}$, .80, 80%
6. $\frac{5}{6}$, .833, 83.3%
7. $\frac{77}{100}$, .77, 77%
8. $\frac{1}{20}$, .20, 20%
9. $\frac{11}{50}$, .222, 22%
10. $\frac{2}{5}$, .40, 40%

Pages 41 and 42

1. 24 pieces of pie
2. 1/4 yard
3. 4 miles
4. 1 1/8 miles
5. 2 1/2 pieces of taffy
6. 3 weeks
7. 75 ounces
8. 66 1/4 inches
9. \$287.65
10. \$21.79
11. \$114.26
12. \$81.16
13. \$300; \$90; \$210
14. \$26.45
15. 25 students
16. 150 children
17. 20 homes
18. 225 cards
19. \$0.87
20. \$1.50
21. 26 minutes
22. 288 boxes
23. 6 pounds
24. 6.25%

Pages 43 and 44

1. \$500 every six months. Take a salary of \$10,000 for Sample:
1st year: \$5,000 + \$5,500 = \$10,500 vs. \$10,000
2nd year: \$6,000 + \$6,500 = \$12,500 vs. \$12,000
2. about 18,000 miles
3. house numbers
4. \$0.20
5. 100%
6. Choco-Chunk and Nuts to U are equal in value. Goodie Two-Shoes is the better buy.
7. 200 miles a day
8. \$4,250.00
9. \$1.25 to break even; \$4.38 to make \$25,000.
10. a. \$14.00
b. \$42.00
c. \$52.50
d. \$87.50
e. \$49.00
f. \$105.00
Yes, he saved \$350.00
11. b
12. a
13. a
14. a
15. After 31 years, the system will still be worth \$10!
16. 52 bushels of wheat, 55 bushels of corn, and 34 bushels of oats.