Personal Financial Literacy

Unit Overview

Being financially literate means taking responsibility for learning how to calculate income taxes on wages and how to create a budget to plan your spending and savings. Using a budget estimator will help you look at monthly earnings and expenses. You will also learn how to look ahead to long-term savings for future needs. Creating a net worth statement will help you see how families evaluate how well they're doing on their financial goals. As you continue through the unit, you will apply what you have learned to solve real-world financial problems.
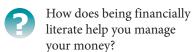
Key Terms

As you study this unit, add these and other terms to your math notebook. Include in your notes your prior knowledge of each word, as well as your experiences in using the word in different mathematical examples. If needed, ask for help in pronouncing new words and add information on pronunciation to your math notebook. It is important that you learn new terms and use them correctly in your class discussions and in your problem solutions.
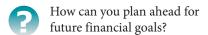
Academic Vocabulary

- income tax
- property tax
- budget
- variable expense
- assets
- compound interest
- coupon
- sales tax
- take-home pay
- fixed expense
- net worth
- liabilities
- monetary incentive
- rebates

ESSENTIAL QUESTIONS

? How does being financially literate help you manage your money?

? How can you plan ahead for future financial goals?

Getting Ready

Write your answers on notebook paper.
Show your work.

1. Write the letter of each pair of fractions that are equal.
   a. $\frac{2}{3}$ and $\frac{4}{5}$
   b. $\frac{5}{8}$ and $\frac{10}{16}$
   c. $\frac{3}{7}$ and $\frac{7}{15}$
   d. $\frac{2}{5}$ and $\frac{5}{10}$
   e. $\frac{3}{5}$ and $\frac{9}{15}$

2. Write an equivalent fraction with a denominator of 100 for each fraction.
   a. $\frac{6}{20}$
   b. $\frac{2}{5}$
   c. $\frac{1}{4}$
   d. $\frac{36}{25}$
   e. $2\frac{3}{5}$

3. Write each percent as a decimal.
   a. 4.7%
   b. 3.2%
   c. 5.8%
   d. 19.6%

4. Multiply. Describe any pattern you notice.
   a. 6.2735×10
   b. 6.2735×100
   c. 6.2735×1000

5. Divide. Describe any pattern you notice.
   a. $87.345 \div 10$
   b. $87.345 \div 100$
   c. $87.345 \div 1000$

6. Divide.
   a. $\$40.20 \div 12$
   b. $\$500.50 \div 0.50$
   c. $\$105.3 \div 2.7$

7. Explain how fractions and decimals are related.

Budgeting and Money Management

How Much Is Too Much?
Lesson 27-1 Understanding Earnings and Budgets

Learning Targets:

- Examine taxes on wages earned and on purchases.
- Analyze a family budget and calculate percentages for each part of a budget.

> **SUGGESTED LEARNING STRATEGIES:** Close Reading, Marking the Text, Summarizing, Create Representations

Learning to manage your money is a skill that you will use throughout life. As you get older, you will start earning money and paying taxes. Among the three major taxes that many people pay are *income taxes*, *sales taxes*, and *property taxes*.

1. The following table shows the median weekly earnings for people with different levels of schooling. Complete the table by calculating the increase in weekly income with each additional level of education.

Education Level	Median Weekly Income (2011)	Increase (in dollars)
Less than high school diploma	$451	—
High school graduate	$638	
Some college, no diploma	$719	
Associate degree	$768	
Bachelor's degree	$1053	
Master's degree	$1263	
Doctoral or professional degree	$1551–1665	

ACADEMIC VOCABULARY

An ***income tax*** is a percent of earnings paid to federal, state, or local governments. A ***sales tax*** is a percentage of the cost of a purchase. A ***property tax*** is a percentage of the value of the property owned.

MATH TIP

Remember that a median is the middle number in a range of values.

2. What is the median increase in weekly income between a high school degree and a college (bachelor's) degree?

3. **Apply mathematics to everyday life.** Suppose a family earns total wages of $800 a week and pays state income taxes of 5% on annual earnings.
   a. How much money will the family pay as state income tax?

   b. Suppose the local government taxes income at 1%. How much additional money will the family pay in taxes to the local government?

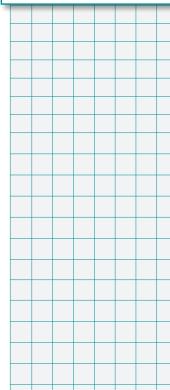   **c.** What amount of money is left after taxes are paid?

My Notes

Most people are also required to pay federal income taxes. Three types of taxes are paid to the federal government based on earnings:

- Income tax, which is a percentage of total earnings
- Social Security tax, which is currently 6.2% of earnings up to $113,700
- Medicare tax, which is 1.45% on all income.

Tax rates can change as lawmakers pass new laws. The following table shows current income tax rates. Employers withhold income taxes, plus Social Security and Medicare taxes, from employees' paychecks.

Tax Bracket	Married Filing Jointly	Single
10% Bracket	$0–$17,000	$0–$8,500
15% Bracket	$17,001–$69,000	$8,501–$34,500
25% Bracket	$69,001–$139,350	$34,501–$83,600
28% Bracket	$139,351–$212,300	$83,601–$174,400
33% Bracket	$212,301–$379,150	$174,401–$379,150
35% Bracket	Over $379,150	Over $379,150

People who work are paid hourly wages or a salary. The current federal minimum hourly wage is $7.25 per hour. Some states have increased this minimum. People who are paid a salary receive a fixed amount per year rather than an hourly wage.

4. If you earned $54,000 a year, what tax bracket would you be in?

5. If you earned $9.80 an hour, how much would you make for a 40-hour week? A year? What federal income taxes would be withheld?

6. The money that is left after taxes are withheld is called ***take-home pay***. Calculate the income taxes, Social Security taxes, and Medicare taxes you would pay on earnings of $54,000. What is the take-home pay?

ACADEMIC VOCABULARY

Take-home pay is the amount of money an employee receives in a paycheck. In addition to taxes, other amounts may be withheld for health insurance and contributions to retirement savings.

A ***budget*** is an estimate of expected income and expenses.

Many people create a ***budget*** to manage current income and expenses, while also planning ahead for long-term financial goals. By writing down income and expenses, people can avoid spending more money than they earn each month. Look at the sample budget on the next page. It is made up of income, expenses, and planned savings. This monthly budget is based on take-home earnings for two wage earners.

My Notes

Monthly Budget

Income (annual take home of $64,646):

Salary/wages (take-home pay)	5,388
Other (bank account interest)	60
Total monthly income	5,448

Expenses:

Housing (mortgage/rent)	1080	24%
Property tax (if not included in mortgage)	385	
Insurance (home, car, life—medical not withheld by employer)	200	
Food (groceries)	970	
Utilities (electricity, water, gas, trash collection)	230	
Cell Phones	128	
Cable/internet/land line phone bundle	145	
Gasoline for car(s)	210	
Child care expenses (day care, tuition, etc.)	400	
Pet expenses (food, grooming, and veterinarian care)	0	
Credit card charges/payments (average monthly)	410	
Entertainment costs (movies, meals, hobbies, etc.)	300	
Gifts/Charitable donations	100	
Other:	0	
Total expenses	4558	

Savings:

Emergency fund	100
Retirement savings	340
College savings	450
Total savings	890

7. What is the amount of total monthly income?

8. What is the amount of total expenses?

9. For each expense, calculate its percentage of total expenses. For example, the housing cost of $1080 is 24% of total expenses (rounded to the nearest whole percent).

10. Which expenses take up the largest share of the budget?

11. What proportion of total take-home pay is saved by this family?

My Notes

ACADEMIC VOCABULARY

A *fixed expense* is one that does not change over a period of time. A *variable expense*, varies—or changes—over time.

Looking at the budget on the preceding page, you see several different types of expenses. Some expenses, such as a mortgage or rent, are *fixed*. Others, called *variable expenses*, can change each month. For example, money spent on entertainment is an example of a variable expense.

In the previous budget, the following expenses would be fixed for a period of time:

- Mortgage/rent
- Property tax
- Insurance
- Cable/internet/phone
- Cell phone costs
- Child care

These expenses would be considered variable because a consumer can decide to spend more or less on them each month. For example, by conserving electricity, utility costs could be lowered.

- Food
- Utilities
- Gasoline
- Pet expenses
- Credit card charges
- Entertainment expenses
- Gifts/charitable donations

12. Calculate the percentage of fixed expenses and variable expenses in the budget on the preceding page.

13. **Communicate reasoning.** If a family wants to reduce its overall expenses, which costs should it look at? Explain why.

Housing, food, and other costs vary in different parts of the country, and within different areas of a state. An online budget estimator is helpful in calculating the costs where you live. An example is at http://www.pine-grove.com/online-calculators/budget-calculator.htm. Many others are available.

14. Research the household costs for your area. Use an online budget estimator to find the minimum household budget (total take-home income) needed for a family in your city. Identify the hourly wage needed to meet this budget. Remember to consider the taxes to be paid on income earned.

Check Your Understanding

15. What taxes are deducted from earnings by most employers?

16. If you earn $700 per week, and you have total taxes of 22.65% taken out by your employer, what is your take-home pay?

17. How does creating a budget help people manage money?

LESSON 27-1 PRACTICE

18. Give examples of the types of taxes that wage earners pay to federal, state, or local governments.

19. If you earn $68,000 per year and you pay total taxes of 32.45%, what is your monthly take-home pay?

20. Calculate total expenses in this budget. Then find the percentage of total expenses for each individual expense. Round percents to the next whole number.

Expenses:

Housing (mortgage/rent)	1280
Property tax (if not included in mortgage)	485
Insurance (home, car, life—medical not withheld by employer)	340
Food (groceries)	1120
Utilities (electricity, water, gas, trash collection)	260
Cell Phones	130
Cable/internet/land line phone bundle	165
Gasoline for car(s)	230
Child care expenses (day care, tuition, etc.)	500
Pet expenses (food, grooming, and veterinarian care)	120
Credit card charges/payments (average monthly)	530
Entertainment costs (movies, meals, hobbies, etc.)	350
Gifts/Charitable donations	100
Total expenses	

21. Using the total expenses in Item 18, calculate the expenses as a percent of take-home pay of $6780.

22. **Communicate mathematical ideas.** With total expenses of $6,390 and take-home pay of $7,450, how much money is left for savings? What percentage of total income is savings?

23. Identify the fixed and variable expenses in Item 20. Calculate the percentage of the total for each.

24. Use a budget estimator to calculate the hourly wage needed to have family take-home income of $3600 per month. Assume total federal taxes of 22.45% and no state income tax.

Learning Targets:

- Construct a statement of financial net worth.
- Calculate and compare simple and compound interest earnings.
- Analyze and compare sales taxes and various ways to save money on purchases.

> **Suggested Learning Strategies:** Close Reading, Marking the Text, Create Representations

Many families measure their financial progress toward meeting goals by calculating their *net worth*. To do this, they collect information on everything owned and its current value. This might include a house, a car, savings, and investments in stock or bonds.These items are *assets*. Most people also owe money to creditors, such as for a mortgage or a car payment. These amounts are *liabilities*. To create a net worth statement, you first list the value of all the assets, or items owned, and calculate a total. Next, list all the amounts owed, the liabilities, and calculate a total. Subtract the total liabilities from the total assets to find the net worth.

My Notes

ACADEMIC VOCABULARY

Net worth is the difference between what is owned and what is owed. *Assets* are items owned, while *liabilities* are amounts owed.

Example A

Assets:

House	$238,000
General savings	48,000
College fund	28,000
Retirement fund	72,000
Total Assets	386,000

Liabilities:

Mortgage owed	110,000
Credit card debt	1,800
Balance on student loans	23,000
Equity loan for home improvement	25,000
Total Liabilities	159,800

Net Worth: 226,200

Assets − Liabilities = Net Worth
$386,000 − $159,800 = $226,200

Try These A

a. Calculate the net worth of someone with assets of $198,000 and liabilities of $154,000.
b. What is the value of assets if someone has a net worth of $142,500 and liabilities of 87,400?
c. What is the value of liabilities if total assets are $204,800 and net worth is $128,900?

My Notes

1. Organize the following information, and use it to create a statement of net worth. Use the My Notes space.

House, $231,160
Credit card debt, $2,680
Savings account, $22,500
Car loan, $14,790
Retirement savings, $87,600
Balance in checking account, $12,368
Mortgage loan, $142,760
Value of second car (no loan), $4,700
Student loans, $32,650

A statement of net worth is useful to see how well you are meeting long-term financial goals. For example, you may want to save a certain amount of money for eventual retirement. Checking net worth regularly shows how much of the goal has been met. When planning for long-term savings, it's a good idea to check that you are earning compound interest on your savings instead of just simple interest.

If you have savings that earns simple interest, the interest earnings are calculated once a year.

2. Calculate the simple interest on savings of $18,470. Use an annual interest rate of 2.7%.

3. Calculate the simple interest on savings of $9,028 invested for six months at a rate of 3.4%.

Savings that earn *compound interest* will earn more money over a period of time than with simple interest.

MATH TIP

Remember that the formula for simple interest is $I = R \times T$ (Interest = Rate times Time).

ACADEMIC VOCABULARY

A *compound interest* on savings is paid more than once a year, thus earning interest on the interest paid each compounding period.

Example B

You have $10,000 to invest for 2 years, and you want to calculate and compare simple and compound interest of 4%. Interest is compounded annually.

Step 1: Calculate simple interest. $10,000 \times 0.04 = 400$

Step 2: Multiply the interest times 2. $400 \times 2 = 800$

Step 3: Calculate compound interest. $10,000 \times 0.04 = 400$

Step 4: Add the principal and interest. $10,000 + 400 = 10,400$

Step 5: For year 2, multiply by 4%. $10,400 \times 0.04 = 416$

Step 6: Add the interest earned for 2 years. $400 + 416 = 816$

With compounding, you would earn $16 more than with simple interest. If the interest is compounded more often, such as semiannually, quarterly, or monthly, the earnings would be higher.

My Notes

Try These B

a. Use simple interest and compound interest of 3% to compare the earnings on savings of $20,000 invested for two years.

b. Explain how compound interest results in higher earnings on savings over a period of years.

One way to increase savings is to find ways to reduce monthly costs. There are several ways to reduce costs. Turning out lights or using less water each month can reduce utility costs. Waiting to buy items when they're on sale can reduce costs for many household needs, such as furniture, clothing, and food.

4. Your local store has a sale with 20% off your favorite jeans. If the jeans are regularly priced at $39.98, what is your sale price? How much would you save?

Another method that stores use to get customers to buy items is to offer a *monetary incentive*.

ACADEMIC VOCABULARY

A *monetary incentive* is a special offer that reduces the total cost of one or more items, such as "buy one, get one free." A *coupon* is a document offering a reduction in price on a specific item, such as a box of cereal.

5. Suppose your family's favorite restaurant is offering an incentive of one meal at the regular price and the second one at half price. If both meals regularly cost $8.50, how much would you pay? What is the savings?

Stores may use *coupons* to get customers into their stores. Grocery stores often use coupons that give a discount of a specific amount of money, such as 50 cents, on the price of an item.

6. Your family shops at a local grocery that offers coupons on many different items. On one shopping trip, your family redeems coupons on 5 items for the following amounts: $0.35, $0.50, $0.75, $1.00, and $0.60. What is the total savings?

7. Some coupons offer "two for one" deals where you get two items for the price of one. If you buy one sweater for $24.99, what is your total cost for a second sweater?

ACADEMIC VOCABULARY

A *rebate* is a sales promotion used as an incentive to get buyers to purchase a specific product.

Some manufacturers use *rebates* to get customers to buy their products. For example, a local store offers a television set for $699 after a rebate of $100. The manufacturer of the television will send the buyer $100 for purchasing that television. As the buyer, you would pay the full price of the television ($799 in this example) and then send the rebate request to the manufacturer to receive the $100.

Most rebates are mail-in rebates. You will need to mail in the rebate coupon and a receipt for the purchase to obtain the amount of the rebate. It can take a few months to receive the money on a rebate. Rebates often have time limits on them, so it is important to mail in coupons and receipts soon after a purchase.

Some stores offer "instant rebates," in which case the amount of the rebate is taken off the price of the item at the time of purchase.

8. Suppose you buy a bicycle that has a manufacturer's rebate of $50. The bicycle costs $179.97 before the rebate. How much will you pay for the bicycle at the store? After the rebate?

9. The local hardware store is offering an instant rebate of $25 on all purchases over $150. If you bought items for $45, $78, and $12, what would be the amount of your rebate?

Check Your Understanding

10. Explain what a statement of net worth is and the information on it.

11. Explain simple and compound interest and compare the benefits of one over the other.

12. Describe and compare incentives offered to customers to get them to buy products.

LESSON 27-2 PRACTICE

13. Use the following information to create a statement of net worth.
    House (net value), $122,600
    Credit card debt, $1,675
    Savings account, $34,500
    Car loan, $12,680
    Retirement savings, $78,700
    Balance in checking account, $13,686
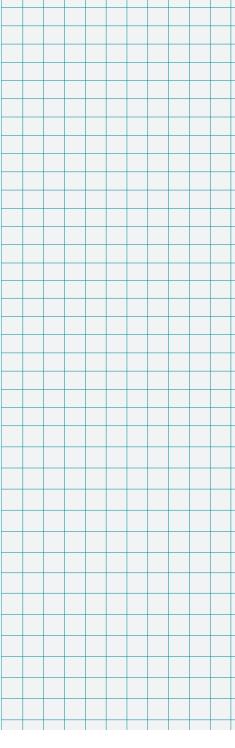   Mortgage loan, $153,440
    Value of second car (no loan), $5,400
    Student loans, $28,520

14. **Communicate reasoning.** Why might a statement of net worth be useful?

15. Calculate simple interest on $7,000 at 3.2% for a year.

16. Calculate compound interest on $4,500 for 2 years at 4%, compounded semiannually.

17. Calculate and compare simple interest and compound interest of 5% on the amount of $12,000 for 5 years.

18. Calculate savings on a purchase of $59.98 with 15% off.

19. Using coupons worth $0.40, $0.60, $1.25, $0.75, and $0.50, how much would you save if you bought the related products?

20. Describe the difference between a rebate and an incentive to "buy one, get one free."

MATH TIP

It's important to remember that buying items you do not need—even on sale or with a coupon or rebate—does not save money.

ACTIVITY 27 PRACTICE

1. List the federal taxes that are usually withheld from paychecks.

2. If you earn $49,400 a year, what amounts of federal taxes would be withheld?

3. Your local city taxes income at 1.5%. If you earn $42,680, how much would you pay in taxes to your city?

4. Research the typical household expenses for your area. Then create a budget to meet those expenses? How much money would you need to earn, either as a salary or an hourly wage, to pay these expenses? Remember to include taxes on the earned income.

5. Create a budget using the following information:

Housing (mortgage/rent)	1170
Interest earned on savings (monthly)	78
Salary (take-home pay)	5,120
Insurance (home, car, life—medical not withheld by employer)	280
Food (groceries)	910
Utilities (electricity, water, gas, trash collection)	245
Cell Phones	110
Cable/internet/land line phone bundle	155
Gasoline for car(s)	190
Child care expenses (day care, tuition, etc.)	550
Savings for retirement	350
Credit card charges/payments (average monthly)	430
Entertainment costs (movies, meals, hobbies, etc.)	250
Gifts/Charitable donations	150
Savings for college	400

6. Explain the difference between fixed and variable expenses. How can they be used to change monthly costs?

7. Use the following information to create a statement of net worth:

House	$293,000
General savings	68,000
College fund	39,000
Retirement fund	92,000
Car	12,500
Mortgage owed	134,600
Credit card debt	1,940
Balance on student loans	18,670
Equity loan for home improvement	30,000

8. Calculate and compare simple and compound interest of 4.2% on savings of $15,000 for 10 years.

9. Calculate 25% savings on a purchase of $68.98.

MATHEMATICAL PRACTICES
Communicate Mathematical Ideas

10. Explain how using a monthly budget and calculating net worth are used to help plan for and meet long-term financial goals.