

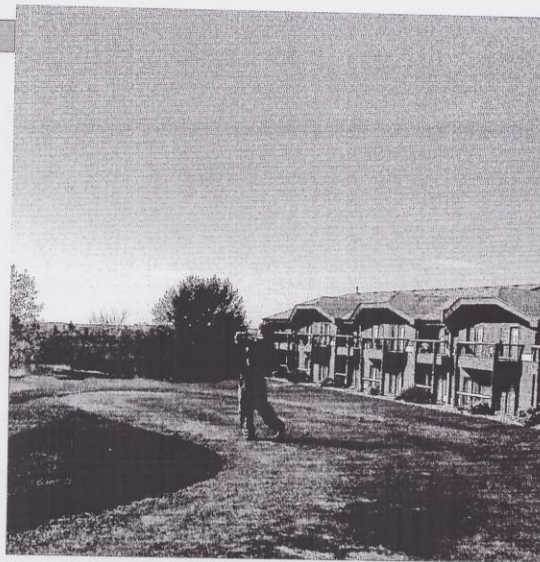
2.1

Wages and Salaries

MATH ON THE JOB

Joseph Galloway lives in a group home for men with schizophrenia in North Battleford, Saskatchewan. He recently finished his high school diploma, taking classes offered to adults with mental illnesses at the Saskatchewan Hospital, where he is an outpatient.

Joseph works at four part-time jobs to earn his spending money. He works one 4-hour shift a week as a short-order cook at McDonald's. He also works one 4-hour shift a week at the Saskatchewan Hospital canteen, selling drinks and snacks. He works one 8-hour day on a work crew organized by the hospital, helping elderly people in North Battleford with chores such as snow shovelling and lawn mowing. From May to October, Joseph works two 3-hour shifts a week at the local golf course selling golf balls and other golf accessories. Joseph is paid the **minimum wage** at the canteen, on the work crew, and at the golf course. In Saskatchewan, this rate is \$8.60 an hour. At McDonald's, Joseph recently was given a raise, and he now earns \$8.75 an hour. How much does Joseph earn each week during the winter months? During the golfing season?



Joseph Galloway works at this golf course in Saskatchewan during the summer months.

EXPLORE THE MATH

minimum wage: the minimum amount a worker must be paid an hour; this rate varies, depending on which province or territory you live in

gross pay: the total amount of money earned; also called gross earnings

Have you worked at a job where you have earned money? Did you earn a fixed amount paid hourly or weekly? Many tradespeople and people who work in service industries earn wages calculated this way. Other people earn salaries, which are often expressed as an annual amount but are paid monthly, semi-monthly, or biweekly. What are some occupations where people earn an annual salary?

The total amount people earn is called their **gross pay**. Later in this chapter, you will learn about deductions that are made from gross pay.

There are occasions when people are asked by their employers to work extra hours in addition to their normal hours. What are some situations where employees may be asked to work **overtime**? How much is a reasonable amount to increase the rate of pay for overtime hours?

ACTIVITY 2.1 INTERPRETING PAY STATEMENTS

Work in a small group to complete this activity. Your friend Jolie has started a job as an apprentice elevator repairperson. Study her first **pay statement**, which is shown below. Pay statements are provided by the employer.

pay statement: a form an employer gives an employee that shows earnings and deductions from earnings for a defined pay period

Employee Name: Jolie			
Company: ABC Elevator Repair		Pay Begin Date: 10/13/2010	Pay End Date: 10/19/2010
General			
Employee ID: 999999		Job Title:	Elevator repair apprentice
Address:		Pay Rate: Annual:	\$19.00/h
Hours and Earnings			
Description	Rate	Hours	Gross Earnings
Regular	19.00/h		\$712.50

1. How many days does the pay period cover?
2. If Jolie's gross earnings are \$712.50, how many hours did she work?
3. Did she earn more or less than the minimum wage in your province or territory?
4. Develop a formula Jolie could use to calculate her earnings for any given pay period.

DISCUSS THE IDEAS

TYPES OF EARNINGS

- Working with a partner, discuss the following questions:
 1. Make a list of the different ways people are paid.
 2. What are several different types of jobs that fall into each category of pay?
 3. Is there an advantage to being paid weekly rather than monthly? Why do you think most workers are not paid weekly?
 4. If you worked at a job in which you earned an annual salary that was paid monthly, and you worked more than 40 hours in a week, how might you be compensated for your overtime work?

Example 1

Each summer, Rick works at the Pacific National Exhibition in Vancouver as a parking lot attendant. His wages this year are \$9.76 an hour and his hours of work vary from week to week. He worked 25 hours for the week August 14–20 and 35 hours for the week August 21–27.

Rick's pay statement is shown below. Check it for accuracy and correct any errors you find.

Employee Name: Rick			
Company:		Pay Begin Date:	14/08/2010
Pacific National Exhibition		Pay End Date:	27/08/2010
General			
Employee ID: 999999		Job Title:	Parking lot attendant
Address:		Pay Rate:	\$9.76/h
		Annual:	
Hours and Earnings			
Description	Rate	Hours	Gross Earnings
Regular	\$8.76	60	\$525.60

SOLUTION

His pay rate is shown as \$8.76 when it should be \$9.76. His gross earnings are \$585.60, not \$525.60.

Mental Math and Estimation

How many hours are there in a work week that is made up of five 7.5-hour days? How many hours would that be in a year?

Example 2

Zhong was hired to be the office clerk at an insurance company. His annual salary will be \$34 756.00.

semi-monthly: twice a month

biweekly: every two weeks

- Why is Zhong not paid annually for his work?
- Would he earn more each pay period if he were paid **semi-monthly** or **biweekly**?

SOLUTION

- a) Being paid annually would create hardship because Zhong would have to work an entire year before he was paid. Most people prefer to get regular pay so they can set monthly budgets to meet their expenses and plan for savings.

- b) $12 \times 2 = 24$ To find the number of semi-monthly pay periods in a year, multiply the number of months in a year by 2.
- $52 \div 2 = 26$ To find the number of biweekly pay periods in a year, divide the number of weeks in a year by 2.

Since the same annual salary will be paid in 26 pay periods for biweekly pay as in 24 pay periods for semi-monthly pay, for each pay period Zhong would earn more if he were paid semi-monthly. However, he would get 2 extra paycheques a year if he were paid biweekly.

ALTERNATIVE SOLUTION

To determine whether Zhong would earn more each pay period if he were paid semi-monthly or biweekly, you could calculate his semi-monthly and biweekly gross pay.

$\$34\,756.00 \div 24 = \1448.17 Divide the annual salary by 24 pay periods for semi-monthly pay.

$\$34\,756.00 \div 26 = \1336.77 Divide the annual salary by 26 pay periods for biweekly pay.

Zhong would earn more each pay period if he were paid semi-monthly.

Example 3

Laura's regular rate at her job in a warehouse is \$9.86 an hour. She works 8 hours a day. She has to work an extra shift on a holiday, and her overtime rate is time and a half.

- a) What are Laura's gross earnings for the holiday?
- b) What is her hourly rate on the holiday?



Laura earns a higher wage when she works at the warehouse on a holiday.

HINT

To calculate overtime, convert the rate to a decimal. For example, double time is 2.0, or twice the rate of pay.

SOLUTION

- a) First, find Laura's regular daily rate. Why is the answer in dollars?

$$\$9.86/\text{h} \times 8 \text{ h} = \$78.88$$

$$\$78.88 \times 1.5 = \$118.32$$
 Multiply Laura's regular daily rate by "time and a half" or 1.5.

Laura's gross earnings for the holiday are \$118.32.

- b) $\$118.32 \div 8 = \14.79 Divide her holiday gross earnings by the number of hours in a work day.

Laura's hourly rate on the holiday is \$14.79.

ALTERNATIVE SOLUTION

First, solve b) by finding the hourly overtime rate.

$$\$9.86 \times 1.5 = \$14.79$$
 Multiply Laura's regular hourly rate by 1.5.

Then solve a).

$$\$14.79 \times 8 = \$118.32$$
 Multiply the hourly overtime rate by the number of hours in a work day.

Laura's gross earnings for the holiday are \$118.32.

Example 4

Gregor works as a glazier, a person who cuts and fits glass, at a window manufacturing company in Steinbach, MB. He earns \$19.99/h for 37.5 hours a week and time and a half for any hours over that. Gregor examines the schedule for the upcoming week, shown here.

WEEKLY SCHEDULE

Employee Name	Day	Start time	End time
Gregor	Sunday		
	Monday	8:00 am	4:00 pm
	Tuesday	8:15 am	4:00 pm
	Wednesday	8:00 am	3:30 pm
	Thursday	8:00 am	4:00 pm
	Friday	9:00 am	4:15 pm
	Saturday	8:30 am	6:30 pm

- a) Describe your strategy for determining the number of hours Gregor will work each day and express these amounts as decimals.
- b) How many hours of overtime will he work?

SOLUTION

- a) To calculate how many hours and minutes Gregor will work each day, you can calculate the number of hours he will work in the morning and add the hours he will work in the afternoon.

First, convert the start and end times from hours and minutes to hours expressed as decimals. For example:

$$8:15 = 8.25 \text{ hours}$$

$$3:30 = 3.5 \text{ hours}$$

Next, subtract the start time from 12:00 noon to determine the morning hours, and add the end time to 0 to determine the afternoon hours (because 12:00 noon is 0 hours pm).

You might want to add another column to the table, showing hours worked, as shown in the following table.



A glazier uses a level to ensure that the window will be straight.

WEEKLY SCHEDULE

Employee Name	Day	Start time	End time	Hours worked
Gregor	Sunday			
	Monday	8:00 am	4:00 pm	8.0
	Tuesday	8:15 am	4:00 pm	7.75
	Wednesday	8:00 am	3:30 pm	7.5
	Thursday	8:00 am	4:00 pm	8.0
	Friday	9:00 am	4:15 pm	7.25
	Saturday	8:30 am	6:30 pm	10.0

- b) Calculate the total number of hours Gregor will work.

$$8.0 + 7.75 + 7.5 + 8.0 + 7.25 + 10.0 = 48.5$$

Then, find the number of overtime hours.

$$48.5 - 37.5 = 11 \quad \text{Subtract normal weekly hours from total hours.}$$

Gregor will work 11 hours of overtime.

ACTIVITY 2.2

MIND MAPPING FOR TRADES



Gaming industry employees use math in their job.

Working in small groups, draw mind maps that show ways in which you would use math in three trades or occupations. Then discuss these questions with your group.

1. How much overlap did you find in the kinds of math that different trades use?
2. Have you worked in any jobs or done chores that required you to use math? If so, give some examples.

Mental Math and Estimation

An office assistant who earns \$10.00 an hour was paid \$120.00 for 10 hours of work. How is this possible?

BUILD YOUR SKILLS

1. Rachel works 40 hours a week as a journeyman printer. She earns \$23.68 an hour.
 - a) What are her gross weekly earnings?
 - b) If she works 49 weeks a year and receives 3 weeks of paid holidays, what are her gross annual earnings?
2. What is the difference between biweekly and semi-monthly pay periods? What advantage does one method have over the other?
3. Luc earns \$497.12 a month and works 12 hours a week. Explain how you would calculate his hourly pay. (Hint: \$10.36 an hour is not correct.)
4. You are cutting lawns for your summer job. One customer gives you the option of being paid \$11.00 an hour or a flat fee of \$35.00 each time you cut the lawn. What factors would you take into account in deciding which option to choose?
5. If Arielle is paid \$9.56 an hour as a swimming lifeguard and she works 12 hours a week, what is her average monthly wage? If she asked for a raise to \$12.50 an hour, would her monthly earnings increase by more or less than \$100.00?

6. Brandon is paid 150% of his regular hourly rate for overtime hours. He is paid \$45.00 an hour for overtime hours. What is his regular hourly rate?
7. Sholeh works as a welder at a jewellery workshop. She receives annual cost-of-living raises. Her salary before receiving a raise is \$29 535.00.
 - a) One year, Sholeh receives a cost-of-living raise of 3.4%. What is her new salary?
 - b) If Sholeh receives cost-of-living raises of 2.8% the following year and 3.2% the year after that, what will her salary be after the three cost-of-living raises?
8. Examine the following table, which records the hours worked by an employee who uses a punch-card system to log her hours.
 - a) How many hours and minutes did this employee work each day?
 - b) What are these amounts expressed as decimals?
 - c) If the employee's rate of pay is \$9.60/h, how much did she earn for the week?
 - d) Why is it preferable to start and end at the specified times in a job that logs exact log-in times?

HINT

Employers don't usually pay for every minute. Round off the hours to the nearest quarter hour, then calculate the pay.

Time Card									
Employee Number: 67891					Approval: <i>N. Kooner</i>				
Employee Name: Navreet Kooner									
For Week Ending: 19/11/10									
Date	Morning		Afternoon		Overtime		Hours		Total Hours
	IN	OUT	IN	OUT	IN	OUT	REG	OT	
Nov 15	9:03	12:05							
Nov 16			4:02	9:06					
Nov 17	8:58	12:00							
Nov 18			4:30	10:01					
Nov 19	8:32	12:00							

9. Examine the following pay statements.
 - a) Franco worked 5 days, from 6:00 pm to 1:00 am, with a 30-minute unpaid dinner break each day. He earns \$8.95/h. Fix the mistakes on his pay statement.

Employee Name: Franco			
Company:		Pay Begin Date: 21/05/2010	
Silver Screen		Pay End Date: 15/05/2100	
General			
Employee ID: 999999		Job Title: Theatre attendant	
Address:		Pay Rate: \$8.95/h	
		Annual:	
Hours and Earnings			
Description	Rate	Hours	Gross Earnings
Regular	\$8.95/h	30.0	\$268.50

- b) In one week, Christine worked three 4-hour shifts, one 5-hour shift, and one 6.5-hour shift. She is paid \$9.54/h. Fix the mistakes on her pay statement.

Employee Name: Christine			
Company:		Pay Begin Date: 14/07/2010	
Whole Earth Gardens		Pay End Date: 20/07/2010	
General			
Employee ID: 999999		Job Title: Cashier	
Address:		Pay Rate: \$9.45/h	
		Annual:	
Hours and Earnings			
Description	Rate	Hours	Gross Earnings
Regular	\$9.54/h	23.5	\$222.08

- c) If you noticed an error on your pay statement, what would you do?

Extend your thinking

10. You are comparing two options for summer jobs. One job is as a summer camp counsellor for 10-year-olds and takes place at your local community centre. The pay is \$240.00 a week for a period of 6 weeks. The other job is working as a house painter. It would require you to commute to different locations and pays a rate of \$11.50/h. You can work 8.5 weeks at this job.
- What factors would you consider in choosing between the two jobs?
 - What additional information would you need to project your earnings from each job?
 - Which job might involve working some overtime? Explain why.
 - Under what circumstances would working overtime appeal to you? Why might you choose not to work overtime?

THE ROOTS OF MATH

THE MINIMUM WAGE IN CANADA

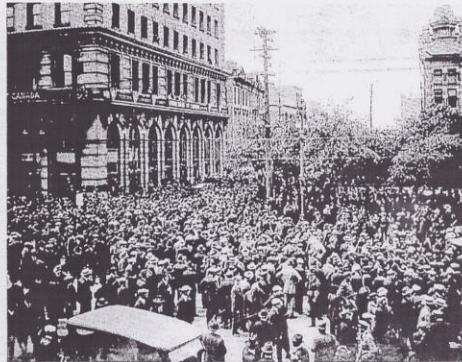
In Canada, there is a minimum wage that guarantees a minimum level of income for employees. The minimum wage is set by the provinces and territories and varies from one province or territory to another. Although the minimum wage is intended to guarantee a basic living wage for less skilled positions, there are several sectors in the economy, such as the service industry, where the minimum wage is the norm, no matter how much experience an individual has. The minimum wage is used as a benchmark for other wages. When the minimum wage rises in response to rising costs of living, other wages also rise.

Until the twentieth century, there was no minimum wage standard anywhere in Canada. Employers could offer people whatever wages they chose to. Many people who worked in factories or in service industries were paid at very low levels and worked very long hours to make enough money to survive.

Achieving laws that require a minimum wage level was the work of tradespeople who joined together in trade unions in the late nineteenth century. They worked together to improve their working conditions and rates of pay. By 1912, 160 000 Canadians belonged to trade unions, and the first minimum wage legislation was passed in British Columbia and Manitoba in 1918. In 1920, Ontario, Quebec, Nova Scotia, and Saskatchewan passed minimum wage laws. Gradually, all the provinces and territories passed minimum wage laws. The last to do so was Prince Edward Island, in 1960.

While most provinces and territories state their minimum wage as an hourly rate, some also have weekly and monthly minimums. Alberta, for example, has a minimum weekly and a minimum monthly wage standard. These apply to certain types of jobs, such as salespeople and domestic workers.

1. What is the minimum wage in your province or territory? How does it compare to the rates in other provinces or territories?
2. What is the annual wage paid in your province or territory if someone earns the minimum wage and works 40 hours a week?
3. Do you think it is sensible to have laws that govern minimum wages?



In 1919, more than 30 000 workers took part in the Winnipeg General Strike to protest poor working conditions, lack of bargaining power, and low wages.

2.2 Alternative Ways to Earn Money

MATH ON THE JOB

Carl Howard is a Red Seal carpenter, which means he is certified to work in any province or territory in Canada. He works as a kitchen cabinet installer on the Sunshine Coast in British Columbia. He is a **self-employed** journeyman who is paid on a **piecework** basis by the cabinet companies he works for.

In the piecework system used by one company, each installed cabinet is assigned a point value. For example, a standard upper or lower cabinet is worth one point. This includes hanging the cabinet and installing its door and hardware such as hinges and door handles. Larger cabinets are worth two points, for example, tall pantry cabinets. The toe kick for each lower cabinet is worth $\frac{1}{2}$ point and so is the crown moulding installed along the top of the upper cabinets. One point is assigned a dollar value, in this case, \$16.00, and the whole kitchen installation payment is calculated by adding up the number of points and multiplying by the dollar value of a point.

If Carl installs a kitchen that contains 6 standard upper cabinets with crown moulding, a pantry cabinet with crown moulding and a toe kick, and 5 standard lower cabinets, each with a toe kick, how much will he be paid for installing that kitchen?



Carl must keep accurate records of his work to ensure he is paid correctly.

EXPLORE THE MATH

self-employed: a person who works for him- or herself rather than for an employer

piecework: when someone is paid a set rate for an amount produced

commission: an amount, usually a percentage, paid to someone for a business transaction

contract: a legal agreement that outlines terms, conditions, and payments for work to be done

Not every working person earns wages or a salary. What kinds of jobs do you think may be paid in each of the following ways:

- on a **commission** basis?
- with a base salary plus commission?
- by **piecework**?
- through a **contract**?

In piecework, people are paid according to the number of items they complete. For example, a person may deliver promotional flyers at five cents a flyer, or a berry-picker may pick organic raspberries for \$0.65 a pound. The number that can be completed in an hour will determine the hourly amount earned.

A contract is an agreement between two or more parties that describes

the amount and type of work and the amount to be paid. There is often a schedule of payments, with payment at each stage of a job as it is completed. With a contract you get paid the same amount regardless of how many hours the job takes. Can you think of a situation where you would prefer to get paid by a contract amount rather than by the hour?

Self-employed people often work on a contract basis with their clients, and they may run their own businesses. What are some advantages and disadvantages of owning your own business?

ACTIVITY 2.3 PIECEWORK VERSUS HOURLY RATES

Work in small groups. Your flyer distribution business offers local stores a contract for delivering promotional flyers to a specified number of households. Four stores each pay you \$0.08 per flyer to deliver flyers on a weekly basis, and you hire two people to work for you.

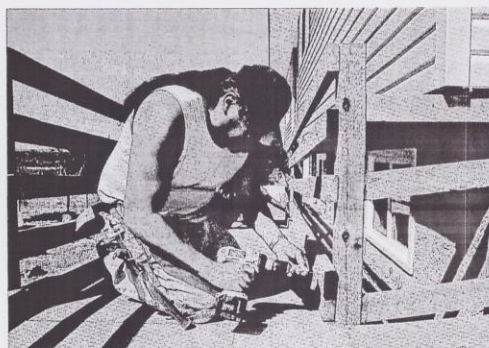
1. What method of payment would you offer your workers?
2. How would you determine whether a piecework rate or an hourly rate will lower your costs?
3. Write an algebraic formula you could use to calculate how much the four stores will pay you.

DISCUSS THE IDEAS

HOME RENOVATION CONTRACTS

You have a home renovation business that specializes in adapting existing homes for people with disabilities.

1. How would you calculate how much to charge customers for the renovations they are requesting?
2. If you bid on a contract with a price of \$14 500.00 and your potential client requests a reduction of 8% to match a lower bid, what would your new bid be?
3. Would you consider making this reduction? Why or why not? What factors would you take into account?



Installing ramps makes homes more accessible for people who use wheelchairs.

4. What would you set as a payment schedule? What is your reasoning?
5. Why do you think the homeowner would prefer to pay on a contract basis rather than an hourly basis?

DISCUSS THE IDEAS

CUSTOM WORK



A handwoven Métis sash.

Artisans—craftspeople who specialize in decorative arts such as weaving and pottery—are often self-employed. They earn money by selling their crafts, including custom work. When a customer hires an artisan to produce a unique piece for an agreed-upon price, this is known as custom work.

A handwoven 100% wool Métis sash is one item that may be custom-made by an artisan. Manitoba, Saskatchewan, Alberta, and British Columbia have all created the Order of the Sash, which recognizes members of the Métis community and non-Métis people who have made cultural, political, or social contributions to the Métis people. Unique ceremonial sashes are given to recipients as part of their award.

1. If a weaver receives an order for 5 custom-made 196 cm sashes that cost \$95.00 and 2 custom-made 224 cm sashes that cost \$125.00, how much will the weaver earn, not including taxes?
2. If you compare the prices of the shorter and longer sashes, which length do you think earns the artisan more? What additional information do you need to accurately answer this question?
3. If a work is custom ordered and then the customer declines the finished piece, the artisan may choose to sell it at a discount. Estimate the price of a 224 cm sash if it is sold at a 15% discount.

Example 1

Manjit is a self-employed aesthetician. She offers European facials for \$85.00 each. She sells skin-care products to her customers at an average markup of 45%. Customers who buy skin toners, protective creams, masks, and related products that total more than \$95.00 receive a 20% discount on both the facial and the skin-care products.

- a) How much does Manjit earn in half a day if she gives 3 facials and sells one customer moisturizers and skin creams totalling \$125.00? Calculate her gross earnings, without taking into account her costs.

- b) How much does Manjit earn from the sale of skin creams during this half day?
- c) If all the customers had paid the full price for the same services and products, how much more would Manjit have earned? Would you advise her to offer the 20% discount? Why or why not?

SOLUTION

- a) Calculate Manjit's earnings from the customer who takes advantage of the discount.

$$\$85.00 \times 0.80 = \$68.00$$

$$\$125.00 \times 0.80 = \$100.00$$

$$\$68.00 + \$100.00 = \$168.00$$

Total the income from all three customers.

$$\$85.00 + \$85.00 + \$168.00 = \$338.00$$

Manjit earns \$338.00 during this half day.

- b) $\$125.00 \times 0.8 = \100.00 Calculate what Manjit charges the customer after a 20% discount.
- $\$125.08 + 1.45 = \86.21 Calculate Manjit's cost before markup.
- $\$100.00 - \$86.21 = \$13.79$ Subtract the costs from the discounted price.

Manjit earns \$13.79 profit from the sale of the skin-care products.

- c) $(\$85.00 \times 3) + \$125.00 = \$380.00$ Calculate the full-price option.
- $\$380.00 - \$338.00 = \$42.00$ Subtract the discounted rate from the full price.

Manjit would earn \$42.00 more if she offered no discount. Offering the discount is probably worthwhile because customers are more likely to buy skin-care products if they get them at a discount. In addition, the markup on the products is high enough that Manjit still earns a profit after discounting them 20%.

Example 2

Gwen works as a sales clerk in a clothing store. She earns a base salary of \$8.00/h plus a 15% commission on the price before taxes of each item she sells. Her work day is 8 hours. One day, Gwen sells a suit with a price of \$625.00, a sweater priced at \$95.00, 3 T-shirts that cost \$45.00 each, and a raincoat priced at \$225.00. How much does she earn that day?

SOLUTION

$$8 \text{ h} \times \$8.00/\text{h} = \$64.00$$

First, calculate Gwen's base salary.

$$\$625.00 \times 0.15 = \$93.75$$

Then calculate the commission on each item she sells. Convert the commission rate to a decimal.

$$\$95.00 \times 0.15 = \$14.25$$

$$\$45.00 \times 0.15 \times 3 = \$20.25$$

$$\$225.00 \times 0.15 = \$33.75$$

Add the commission amounts and the base salary to find her total earnings for the day.

$$\$64.00 + \$93.75 + \$14.25 + \$20.25 + \$33.75 = \$226.00$$

Gwen earns \$226.00 that day.

ALTERNATIVE SOLUTION

Alternatively, you could add the prices of all the items together and multiply by 0.15, then add that amount to the base salary.

Example 3

Hien is a painting contractor. He negotiates a contract with a homeowner to paint the exterior siding on a house at a rate of \$30.00/h plus the cost of materials. It takes Hien six 8-hour days to prepare and paint the siding, and he uses 15 gallons of paint that cost \$45.00 each. What is the total value of the contract?

SOLUTION

First, calculate the value of Hien's time.

$$6 \times 8 \times \$30.00 = \$1440.00$$

Multiply the number of days by the number of hours per day and then by the amount per hour.

Hien's time on this job is worth \$1440.00.

Next, calculate the cost of materials.

$$15 \times \$45.00 = \$675.00$$

Multiply the number of gallons of paint by the price of one gallon.

The cost of materials is \$675.00.

Add the two amounts to find the total price.

$$\$1440.00 + \$675.00 = \$2115.00$$

The total value of the contract is \$2115.00.

Mental Math and Estimation

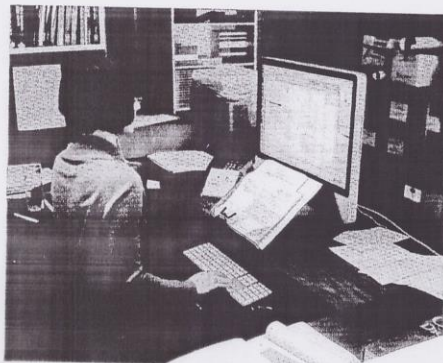
Jagdish earns \$800.00 a week as an autobody technician. His work week is 40 hours. If he works only 35 hours one week, how much will he get paid?

BUILD YOUR SKILLS

1. Suggest two benefits self-employed people might enjoy. Suggest two disadvantages of self-employment. On balance, would you prefer to be self-employed? Why or why not?
2. Ginpon, an aluminum fabricator in Richmond, BC, accepts a contract to make an aluminum gate for \$500.00.
 - a) If the cost of materials and labour to make the gate is \$425.00, how much is his profit on this gate?
 - b) What is this amount expressed as a percentage of the contract?
 - c) If the cost of materials were to increase after the contract was signed, could Ginpon adjust the price? Explain your reasoning.
3. Leo is a self-employed plumber. One month, his plumbing business had three contracts for \$2500.00, \$7000.00, and \$275.00. The cost of Leo's expenses and materials to complete these contracts was \$7200.00.
 - a) How much did Leo earn an hour based on a 40-hour work week?
 - b) Suggest two ways in which Leo could raise his hourly rate to \$20.00.
4. Ling works as an assistant to a florist. She can be paid \$2.75 for every arrangement or \$13.25/h. Ling estimates she could create about five arrangements an hour. Which payment scheme would you recommend and why?



One of a plumber's tasks is to remove roots from drains with a snake.



Website designers often work on a contract basis.

5. Marlene is a website designer. In January, she creates a website for a new client, charging \$13 000.00. Marlene bids on and obtains a maintenance contract for the balance of the year that will pay her \$200.00/month, beginning in February.
 - a) How much will the maintenance contract be worth?
 - b) How many hours a month do you think would be reasonable to spend on website maintenance, given the contract amount?
 - c) How much will Marlene earn this year from this client?
6. William is a salesperson at an electrical supply company. He earns a base salary of \$24 000.00 a year plus a commission of 12% on electrical supplies such as wire, switches, and fixtures. If William aims to earn a total of \$32 000.00 a year, how many dollars' worth of electrical supplies will he need to sell?
7. Dorothy, a cabinet installer, earns income on a piecework basis. When she has to return to a customer's home on a service call to make changes or repairs, she is paid by the hour. The service-call rate is \$30.00 an hour.
 - a) If Dorothy installs 6 upper cabinets at a rate of \$15.00 each, 6 lower cabinets at a rate of \$15.00 each, and returns twice for service calls that each take 3 hours, how much will she earn in all from this job?
 - b) Think of two ways that piecework benefits a working person.
 - c) What advantages or disadvantages might piecework have for an employer?

Extend your thinking

8. You are a painting contractor who has been asked to provide a quote for painting the living room in a customer's home. The room has a fireplace and a glass patio door. The fireplace and marble mantel is 1.75 m wide and is as high as the room. The patio door is 3.5 m wide and extends from floor to ceiling.
 - a) What measurements would you need to take?
 - b) What other calculations are involved in producing the quote?
 - c) Write two formulas, one for calculating total costs and one for calculating percentage of profit.

PUZZLE IT OUT

A WEIRD WILL

A wealthy lawyer owned 11 expensive cars. When he died, he left a weird will. It asked that his 11 cars be divided among his three sons in a particular way. Half of the cars were to go to the eldest son, one-fourth to his middle son, and one-sixth to the youngest.

Everybody was puzzled. How can 11 cars be divided in such a way?

While the sons were arguing about what to do, a mathematics teacher drove up in her new sports car.

"Can I be of help?" she asked.

After the sons explained the situation, she parked her sports car next to the lawyer's 11 cars and hopped out. "How many cars are there now?" The sons counted 12.

Then she carried out the terms of the will. She gave half of the cars, 6, to the oldest son. The middle son got one-fourth of 12, or 3. The youngest son got one-sixth of 12, or 2.

"6 plus 3 plus 2 is 11. So, one car is left over, and that's my car."

She jumped into her sports car and drove off. "Glad to be of service!"

Can you solve a similar will with 17 cars?



The teacher used her sports car and her math skills to help the three sons.

2.3 Additional Earnings

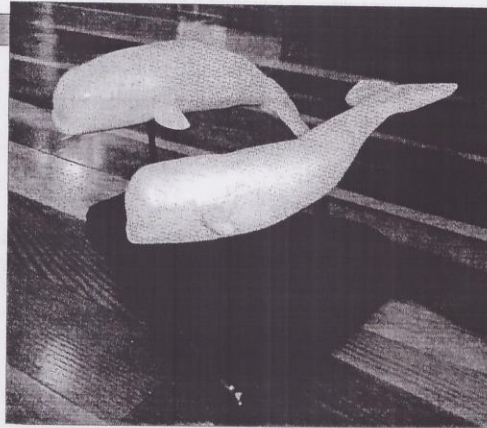
MATH ON THE JOB

Emiko works for an art gallery that sells works of art such as sculptures, paintings, photographs, and prints and also rents them to businesses and individuals to decorate their offices and homes. Emiko took a certificate course in business administration at a college, specializing in marketing.

Emiko advises corporate and private clients on art rentals and promotes her gallery's collection. She maintains a computerized database of artists her gallery represents. This database contains biographical information about the artists and records of the works the gallery carries for rental and sale.

Emiko earns a base salary of \$26 000.00 a year, but she is able to earn extra money when she makes sales. Emiko's employer pays her a **bonus** of 15% of the first month's rental whenever she signs up a new client for a long-term rental. She also receives a bonus of 3% of the sale price when a rented work is sold outright to a client.

If Emiko arranges a rental of an Inuit stone carving with a new client and the rental rate is \$60.00/month, what will Emiko's bonus be? If the customer later decides to purchase the carving for \$4250.00, what bonus will Emiko earn?



These alabaster beluga whales were carved by Joe and Sam Ashoona, Inuit carvers who live in Yellowknife.

EXPLORE THE MATH

bonus: extra pay earned when certain conditions of employment have been met or exceeded

shift premium: extra payment for non-standard work hours

In certain jobs, people earn additional money beyond their basic wage or salary. You might have contributed to these additional earnings. If you have a pizza delivered, do you tip the delivery person? When you get a great haircut, do you give the hairdresser a tip to show your appreciation? It is common for people in service industry jobs to earn tips from satisfied customers.

Another form of additional earnings that is often related to job performance is a bonus. For example, employers may pay bonuses to staff who exceed sales targets or sign up new customers.

Some people earn extra money based on their work environment or the time of day they work. People who work in remote areas might earn an isolation allowance. People who work in potentially dangerous situations, such as members of the armed forces, may earn danger pay. If you work non-standard hours, your employer might pay you a **shift premium**. What hours would be considered non-standard? Can you think of jobs in which shift premiums might be paid? How else might employees earn money in addition to their basic rate of pay?

ACTIVITY 2.4

A BABYSITTING SERVICE

For the summer months, you have decided to work at a neighbourhood babysitting service. The service requires you to have your Red Cross babysitting certification and to provide your own transportation to the clients' homes. When you work between the hours of 08:00 am and 5:00 pm, you earn \$10.00 an hour. You receive a shift premium of an additional \$1.50 an hour for every hour you work beyond the standard hours. You can also earn a \$7.00 bonus each shift if you ensure your client's house is tidy before you leave.

The job doesn't pay overtime. You can work up to 10 hours a day. You are able to work two shifts in a day, but only if there's at least an hour break between them.

WEEKLY SHIFT SCHEDULE

<i>Client</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>
Bains	12:00 pm – 4:00 pm	8:00 am – 12:00 pm	8:00 am – 12:00 pm	8:00 am – 12:00 pm	8:00 am – 12:00 pm
Mitchel	10:00 am – 2:00 pm	10:00 am – 4:00 pm	10:00 am – 2:00 pm	9:00 am – 3:00 pm	10:00 am – 2:00 pm
St. Germaine			4:00 pm – 6:00 pm	8:00 am – 6:00 pm	
Longriver	8:30 am – 4:30 pm	8:30 am – 4:30 pm	8:30 am – 4:30 pm	8:30 am – 4:30 pm	8:30 am – 4:30 pm
Lee	7:00 am – 11:00 am	3:00 pm – 5:00 pm	7:00 am – 11:00 am	7:00 am – 11:00 am	

1. What is the most money you can earn on a Monday?
2. What's the most money you can earn in a week?
3. If you only want to work 20 hours a week, which shifts would you choose? How much would you earn from these shifts?
4. What expenses might you ask the babysitting service to pay for?
5. On Wednesday you earned \$68.50. You worked one shift premium hour and earned one bonus. Which shifts might you have worked?

DISCUSS THE IDEAS

EARNING TIPS



Servers often share tips with kitchen staff.

People who work in restaurants usually earn some of their income in the form of tips, often paid in addition to the minimum wage. Because many people's first jobs are as servers, this is an important type of income to understand. Many people also make a lifelong career in the restaurant industry. Consider the following questions about income from tips.

1. Your restaurant gives 5% of the tips received in a shift to employees working in the kitchen. If \$2100.00 is received in tips, and there are 5 people working in the kitchen, how much will each person receive?
2. You worked a four-hour shift as a server and your customer bills totalled \$2500.00 before tips. Your rate of pay is \$8.75/h.
 - a) If all your customers tipped you 10%, how much did you earn an hour in wages and tips?
 - b) If all your customers tipped you 15%, how much did you earn an hour in wages and tips?
 - c) If all your customers tipped you 20%, how much did you earn an hour in wages and tips?
3. Do you think certain working hours would be better for earning tips? Which hours? Why?

Example 1

Kyle works in a bookstore selling books. He also sells customers reward cards for \$30.00 that will give them a discount on future purchases. His employer gives him a bonus of 10% of the amount received if he sells more than 20 cards in a month. If his regular wages are \$1883.77 and he sells 27 reward cards one month, what will Kyle's wages be including the bonus?

SOLUTION

Find the bonus amount.

$$\begin{array}{ll} \$30.00 \times 27 = \$810.00 & \text{Multiply the cost of one card by the} \\ & \text{number of cards sold.} \end{array}$$

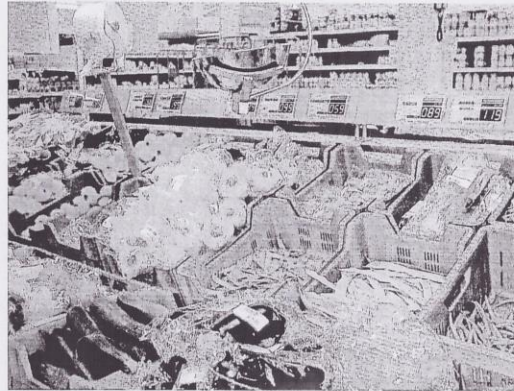
$$\begin{array}{ll} \$810.00 \times 0.10 = \$81.00 & \text{Find 10\% of the total sales amount.} \end{array}$$

$$\$81.00 + \$1883.77 = \$1964.77$$

Kyle will earn \$1964.77.

Example 2

Jacob works as a stock clerk for a grocery store in Moose Jaw, SK. His regular pay is \$12.00 an hour, but he earns a shift premium of \$2.00 an hour for any hours he works between 5:00 pm and 8:00 am. Jacob also earns 1.5 times his pay rate in overtime for any hours he works above 35 hours a week. His timesheet is shown below.



A stock clerk refills grocery shelves with fresh produce as needed.

- What percentage of Jacob's weekly hours are regular hours?
- What percentage of his weekly earnings are paid at the regular rate?

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12:00 am – 8:00 am	12:00 am – 8:00 am	4:00 pm – 12:00 am	6:00 am – 11:00 am	6:00 am – 11:00 am	8:00 am – 3:00 pm

SOLUTION

- Calculate the percentage of regular hours Jacob worked this week.

$$8 \text{ h} \div 41 \text{ h} = 0.195$$

Divide the number of regular hours by the total hours Jacob worked.

19.5% of Jacob's hours were at the regular rate.

- First, calculate the percentage of Jacob's earnings that were at the regular rate.

$$8 \text{ h} \times \$12.00/\text{h} = \$96.00 \quad \text{Calculate Jacob's regular pay.}$$

$$6 \text{ h} \times \$18.00/\text{h} = \$108.00 \quad \text{Calculate his overtime pay.}$$

$$27 \text{ h} \times \$14.00/\text{h} = \$378.00 \quad \text{Calculate his shift premiums.}$$

$$\$96.00 + \$108.00 + \$378.00 = \$582.00$$

$$\$96.00 \div \$582.00 = 0.165 \quad \text{Divide the amount Jacob earned at his regular rate by his total earnings.}$$

16.5% of Jacob's weekly earnings will be paid at his regular rate.

Why do you think the percentage of regular rate earnings is different from the percentage of regular hours worked?

ALTERNATIVE SOLUTION

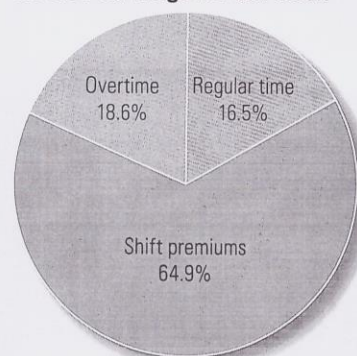
Calculate the percentages by graphing them on pie charts.

Jacob's hours for the week

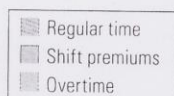


19.5% of Jacob's hours were at the regular rate.

Jacob's earnings for the week



16.5% of Jacob's weekly earnings will be paid at his regular rate.



BUILD YOUR SKILLS

- Julia was a participant in the Department of National Defence's RAVEN program for Aboriginal youth. Now, she is a naval weapons technician in the Canadian Armed Forces. Julia is posted to a war zone and will earn \$1900.00/month in danger pay on top of her annual salary of \$51 250.00.
 - What will her annual salary be, including danger pay?
 - What will her monthly pay be?
- David works as a dishwasher at a private club. He receives 1% of the tips collected in the club during his shift. If the total amount of tips collected is \$760.00, how much will David's portion be?
- Tristan works as a restaurant server. He is paid \$8.50/h and works a 5-hour shift, 4 days a week. On a typical day, his customer bills total \$650.00 before tips, and almost every customer tips him 15%. Estimate how much Tristan will earn in wages and tips in 4 weeks.
- Layla works as a barista, someone who makes and serves coffee in a specialty coffee shop. She earns the minimum wage of \$8.00 an hour, as well as an equal share of any tips that customers leave in a jar by the till.

- a) Develop a formula to figure out Layla's gross earnings in a shift, including tips.
 - b) During Layla's 6-hour shift, the total in tips is \$53.62. There are three people working at the time. Layla determines that she earned \$68.21 for that shift. Is she correct?
5. Ivan gets an annual bonus of 15% of his base salary if he exceeds sales quotas by \$10 000.00. If his base salary is \$42 000.00 and he exceeds the sales quota by the required amount, what is his bonus? What is his total salary for that year?
 6. Francis applies for a job as a commercial transport inspector in Tête Jaune, BC. He receives a starting salary of \$38 901.76 and an isolation allowance. If Francis grosses \$41 610.52 for the year, what would his monthly isolation allowance be?
 7. Rishma works as a security guard at Watson Lake Airport, YT. Her regular work shift is 3:00 pm to 11:00 pm. At this airport, a shift premium of \$2.00 an hour is paid on any hours worked between 5:00 pm and 8:00 am.
 - a) For how many hours per shift is Rishma paid a shift premium?
 - b) If Rishma's regular hourly rate of pay is \$17.36, how much is her gross pay for one shift?
 - c) If Rishma works 5 days a week, what percentage of her weekly wage is at the shift premium rate?
 - d) What percentage of her weekly schedule is regular hours?

Extend your thinking

8. Rosa is a community wellness nurse in Fort Simpson, NT. She attends a meeting of the Deh Cho Health & Social Services Authority in Fort Providence. To attend the meeting, she drives her own car 325.3 km. Her employer will reimburse her at a rate of \$0.605/km.
 - a) How much will Rosa receive as reimbursement for her trip?
 - b) Is this fair compensation for the use of your own car for work? Why or why not? What factors would you consider?



This home-care nurse travels to her patients. She must keep a record of her travel so that she can request reimbursement from her employer.

PROJECT—A PAYROLL PLAN FOR A SUMMER BUSINESS

PREPARING A PAYROLL POLICY



You might need to provide employees with safety equipment or tools.

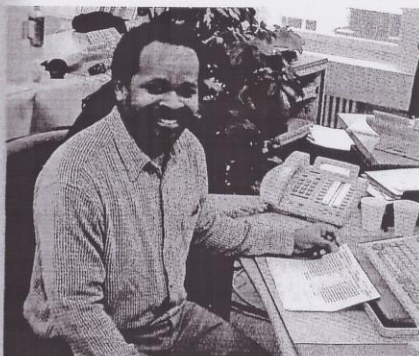
Earlier, you wrote a paragraph describing your plans for the number of staff you plan to hire and how much you will pay them. You have now learned more about how income is calculated and about extra payments working people may earn. Do you want to revise your paragraph, considering what you have learned?

You will now add some more information to your project file.

- Develop a formula that describes your regular payroll costs for a week. If you decided to include an on-call person, don't include that person's wages because his or her hours will vary.
- Write a short policy memo to your employees so they understand what their income will be, what benefits you will offer, if any, and whether the rate of pay will change if they work weekend or overtime hours. Include the following items:
 - the regular work day hours and the days they will work;
 - the regular hourly rate of pay (the minimum wage for your province or territory);
 - overtime rate, if you have one, and which hours it will be paid for; and
 - a list of any benefits that you will offer.

Deductions and Net Pay

2.4



Eric has to calculate a number of deductions from the miners' wages, including union dues.

MATH ON THE JOB

Eric works as an administrative assistant at a mining company. He has a certificate in business administration from a college. At work, Eric does a variety of financial transactions, including the payroll for the company employees. Eric has to calculate the gross wages of each person and then subtract deductions for government programs, such as income tax, the Canada Pension Plan, and Employment Insurance, and for company programs, such as a dental plan. Eric relies on the Canada Revenue Agency instructions for calculating these amounts.

Eric also has to deduct union dues from the employees' paycheques. If an employee earns \$32.50/h, works 40 h/week, pays 2.4% in union dues, and is paid weekly, how much are the weekly union dues? What is the hourly rate?

EXPLORE THE MATH

As you learned earlier, the total amount of money a person earns at his or her job is called gross pay. Working people are not usually paid their gross pay, however. Instead, they take home their **net pay**. Net pay refers to the amount left after certain deductions have been made by an employer.

net pay: also known as take-home pay; refers to the money paid to an employee after deductions have been made

Look at the pay statement shown here. What categories of deductions are made from gross pay?

Employee Name: Hermione		
Company:	Pay Begin Date: 09/08/2010	Net Pay:
	Pay End Date: 15/08/2010	Cheque Date: 16/08/2010
General		Taxes Data
Employee ID:	Job Title: Appliance Repair Apprentice	Description Federal
Address: 123 Main Street Dawson City, YT	Pay Rate: \$650.00/wk Annual: \$33 800.00	Claim Code 1
Hours and Earnings		Taxes
Current		Description Amt.
Description	Rate Gross Earnings	
Regular	\$650.00/wk \$650.00	Federal \$61.15
Before-Tax Deductions		Provincial \$28.70
Description	Amt.	CPP \$28.43
Union Dues	\$14.10	EI \$11.25
Pension	\$20.50	Total \$129.53
Total	\$34.60	

Based on the amounts deducted for union dues and pensions, what percentage of Hermione's gross pay does she pay in union dues and what percentage does she contribute to a pension?

Do you think deductions are the same for everyone? Why or why not?

Look in the Taxes portion of the pay statement. What do CPP and EI stand for? Why do most working Canadians contribute to these plans?

The federal and provincial deductions on the pay statement are income tax payments. The amount of income tax you pay varies according to your personal circumstances and the province/territory in which you live.

When you begin a new job, your employer requires you to complete a TD1 form (Personal Tax Credits Return) to determine the amount of income tax you should pay. From your TD1 exemption claims, you determine your claim code, which your employer uses to calculate your tax deductions. Many people are only able to claim the basic personal exemption, which is TD1 claim code 1.

benefits: a range of programs that benefit employees; these vary from employer to employer

In addition to paying taxes, many people pay amounts from their gross pay for a wide range of **benefits** and programs, such as dental plans and savings plans.

What are some pros and cons for having deductions like these made directly from your paycheck?

When all deductions have been made, the amount remaining—the net pay—is paid to the employee.

DISCUSS THE IDEAS

LIFESTYLE BENEFITS



People sometimes choose a job because of its attractive lifestyle benefits.

Some workplaces provide lifestyle benefits to their employees that are connected to the nature of the business or organization. For example, educational institutions may offer free tuition to their employees for courses they offer. What other lifestyle benefits might be offered to employees, for example, at a ski resort or a golf course?

You have a 16-week contract as a lift operator at Marmot Basin in Jasper, and you will be working between 12 and 20 hours a week. Your employer offers you a choice in how you are paid: a straight wage of \$10.50/h or \$8.50/h plus a weekday season pass that has a value of \$679.00. Which one would you choose? What factors would you consider in your choice?

ACTIVITY 2.5

PROS AND CONS OF DEDUCTIONS

Work in pairs for this activity. If all workers received their gross pay without any deductions, what might the consequences be? Construct a table that shows the pros and cons of contributing to the Canada Pension Plan and Employment Insurance and paying federal and provincial/territorial taxes.

Example 1

You need to calculate the Canada Pension Plan deduction for Amanda, whose pay statement is shown here. In 2008, the CPP contribution rate was 4.95% of any gross earnings above \$3500.00.

Employee Name: Amanda			
Company:	Pay Begin Date: 08/17/2008	Net Pay:	
	Pay End Date: 08/23/2008	Cheque Date:	

General			Taxes Data	
Employee ID:	Job Title:	Description	Federal	
Address: 123 Main St. Cochrane, AB	Pay Rate: \$500.00/wk Annual: \$26 000.00	Claim Code	1	

Hours and Earnings			Before-Tax Deductions		Taxes	
	Current		Description	Amt.	Description	
Description	Rate	Gross Earnings	Union Dues		Federal	
			Pension		Provincial	
Regular	\$500.00/wk	\$500.00	Total		CPP	?
					EI	
					Total	

SOLUTION

First find the basic pay-period exemption that applies in this case.

$$\$3500.00 \div 52 \text{ weeks} = \$67.31$$

$$\$500.00 - \$67.31 = \$432.69$$

Subtract the basic exemption from the gross pay.

$$\$432.69 \times 0.0495 = \$21.42$$

Multiply by the CPP contribution rate.

The CPP deduction is \$21.42.

ALTERNATIVE SOLUTIONS

There are several other ways to find the amounts of the CPP deduction. The Canada Revenue Agency has an online calculator that employers may use. It also publishes a series of payroll deduction tables that employers may consult, electronically and on paper. Employers may also use specialized computer software that has built-in deduction formulas that calculate deductions automatically, once the basic exemption and payroll procedures are entered.

Example 2

Referring to Amanda's pay statement on p. 81, calculate the Employment Insurance premium that will be deducted from her weekly pay. In 2008, the EI premium rate was 1.73% of gross earnings.

SOLUTION

$$\$500.00 \times 0.0173 = \$8.65$$

Multiply the insurable earnings by the EI premium rate.

The EI deduction will be \$8.65.

ALTERNATIVE SOLUTIONS

As outlined in Example 1, the Canada Revenue Agency provides several tools that can assist employers to find the deduction amounts. Information on methods of calculating EI premiums can be found at www.cra-arc.gc.ca/tx/bsnss/tpcs/pyrll/clcltng/ei/menu-eng.html.

Example 3

HINT

Remember that you need to select the income tax tables for the province or territory discussed in each problem.

The CRA website is at <http://www.cra-arc.gc.ca/>

Select "Payroll" under the "Business" heading and then select "Payroll Deductions Online Calculator."

- Calculate the amount of income tax to deduct from Amanda's paycheck. Her TD1 claim code is 1, and she lives in Alberta.
- Calculate her net pay.
- Fill in all the deductions that will be entered on her pay statement.

SOLUTION

- First, find the online Payroll Deductions Tables for your province or territory on the Canada Revenue Agency website. In this example, we use the Alberta Payroll Deduction Tables effective January 1, 2008.

- b) Look up two amounts in the tables, a federal amount and a provincial amount. Use the amount (\$500.00), the pay period (weekly), and the TD1 claim code (1) to locate the amount of tax to deduct.

Federal tax payable is \$40.15.

Provincial tax payable is \$15.90.

Subtract CPP, EI, and federal and provincial taxes from the gross wages.

$$\$500.00 - \$21.42 - \$8.65 - \$40.15 - \$15.90 = \$413.88$$

Amanda's net pay will be \$413.88.

c)

Employee Name: Amanda			
Company:	Pay Begin Date: 08/17/2008	Net Pay: \$413.88	
	Pay End Date: 08/23/2008	Cheque Date: 08/23/2008	

General		Taxes Data	
Employee ID:	Job Title:	Description	Federal
Address: 123 Main St. Cochrane, AB	Pay Rate: \$500.00/wk Annual: \$26 000.00	Claim Code	1

Hours and Earnings			Taxes	
	Current		Description	Current
Description	Rate	Gross Earnings	Federal	\$40.15
Regular	\$500.00/wk	\$500.00	Provincial	\$15.90
			CPP	\$21.42
			EI	\$8.65
			Total	\$86.12

ALTERNATIVE SOLUTIONS

You can also calculate the federal and provincial/territorial income tax amounts manually by looking up the percentage rates in the tax tables and multiplying by the income amount. The Canada Revenue Agency also has an online calculator available at www.cra.gc.ca/pdoc. Many businesses use software that automates the calculation of government deductions.

Mental Math and Estimation

You know that all your deductions add up to approximately 38% of your gross pay and you earn \$950.00 a week. Estimate what your net pay will be.

ACTIVITY 2.6 COMPARING DEDUCTIONS



This cook is preparing desserts for a work crew.

Francine, a cook who worked in a diner in Aubigny, MB, moved to Fort McMurray, AB to work as a cook on an oil rig. In Aubigny she earned \$427.00 a week. In Fort McMurray she earned \$2300.00 a month. She was paid twice monthly at both jobs.

- For each job, calculate her gross pay for each pay period. Then use the payroll deductions online calculator to determine deductions for CPP, EI, and federal and provincial taxes. What was her net pay at each job?
- On two blank pay statements, fill in all the relevant information for both jobs: gross earnings, all deductions, and net pay.
- How much more did Francine pay in taxes at the Alberta job?

Example 4

taxable income: income on which federal and provincial/territorial tax is paid

Some benefit deductions are not taxable. For example, union dues and pension contributions are not **taxable income**.

- In the pay statement shown on p. 85, what is the person's taxable income?
- How much income tax will he or she pay?
- Using the CPP and EI amounts from Examples 1 and 2 and the income tax amount in this example, find the net pay. Assume the TD1 claim code is 1, the province is British Columbia, and the tax tables were from January 2008.

Employee Name:				
Company:	Pay Begin Date: 08/17/2008	Net Pay: \$413.88		
	Pay End Date: 08/23/2008	Cheque Date: 08/23/2008		
General				
Employee ID:		Job Title:		
Address:		Pay Rate: \$500.00/wk Annual: \$26 000.00		
Taxes Data				
Description		Federal		
Claim Code		1		
Hours and Earnings			Before-Tax Deductions	
	Current		Description	Amt.
Description	Rate	Gross Earnings	Union Dues	\$1.38
Regular	\$500.00/wk	\$500.00	Pension	\$43.00
			Total	?
Paycheque Summary			Taxes	
Gross Earnings	Taxable Gross	Total Taxes, CPP, and EI	Description	Current
\$500.00	?	?	Federal	?
			Provincial	?
			CPP	?
			EI	?
			Total	?
			Total Deductions	Net Pay
			?	?

SOLUTION

- a) $\$500.00 - \$1.38 - \$43.00 = \455.62 Subtract the benefit deductions from the gross income.

The taxable income is \$455.62.

- b) Look up the taxable income in the federal and provincial tax tables (remember to use the British Columbia tax tables for this example).

The federal tax is \$33.40.

The provincial tax is \$10.40.

- c) Subtract the CPP, EI, and income tax from the taxable income to find the net pay.

$$\$455.62 - \$2.42 - \$8.65 - \$33.40 - \$10.40 = \$400.75$$

The net pay is \$400.75.

ALTERNATIVE SOLUTIONS

As was the case in the other examples in this section, the Canada Revenue Agency provides a number of tools to assist people in calculating government deductions.

PROJECT—A PAYROLL PLAN FOR A SUMMER BUSINESS

CREATING A PAY STATEMENT

It is time to calculate the deductions that will reduce your employees' weekly gross pay.

Create a spreadsheet or table to record your calculations and add it to your project file. Assume that your employees, who are likely fellow students, will have a TD1 claim code of 1.

Include the following items:

- gross pay for each employee;
- deductions for CPP, EI, and income tax;
- net pay; and
- a totals column for each category of deduction.

T Now, design a sample weekly pay statement that lists gross pay, deduction amounts, and net pay. You can use a spreadsheet or other layout software to create this statement.

Employee Name:			
Company:	Pay Begin Date:	Net Pay:	
	Pay End Date:	Cheque Date:	

General		Taxes	
Employee ID:	Job Title:	Description	Current
Address:	Pay Rate: Annual:	Federal Tax	
		Provincial Tax	
		CPP	
		EI	
		Income Tax	
		Total	

Hours and Earnings			
Description	Rate	Hours	Gross Earnings

Paycheque Summary			
	Gross Earnings	Total Deductions	Net Pay

BUILD YOUR SKILLS

1. What is the difference between taxable income and gross income?
2. Two friends work similar jobs at two different companies. One gets paid \$1458.00 twice a month and the other one gets paid \$1346.00 biweekly.
 - a) Which person has a higher annual salary?
 - b) In what ways would their payroll deductions differ?
3. Lianne is paid \$750.00 biweekly for her part-time job as a dental assistant. Explain how you can determine what her EI premium will be.
4. Helen is paid \$3170.06 semi-monthly. She pays deductions of \$17.12 for union dues and \$126.40 for the company pension plan.
 - a) What is her taxable income?
 - b) Explain which is higher, her taxable income or her net pay.
5. Amber works as a cashier and earns \$960.00 biweekly. Each pay period, her employer deducts \$69.50 for federal tax, \$21.91 for provincial tax, and 1.73% for EI premiums. The CPP contribution rate is 4.95%, and the CPP annual exemption is \$3500.00. What is Amber's net pay?
6. Ruaridgh is a boat salesperson. He works part-time at a marina in Prince Rupert, BC where he earns \$2500.00 a month, paid monthly. He has a second part-time job at another marina nearby on the Skeena River, where he earns \$2500.00 a month, paid semi-monthly. His TD1 claim code is 1. (See Hint on p. 82.)
 - a) What will Ruaridgh's monthly CPP deduction be for each job?
 - b) What will his monthly EI premiums be?
 - c) How much income tax will be deducted monthly from Ruaridgh's earnings from both his jobs?
 - d) What is his net pay each month?
7. Pierre earns \$3461.54 a month, paid semi-monthly. Each pay period, his employer deducts \$172.98 federal tax, \$69.82 territorial tax, \$78.45 for CPP, and 1.73% for EI premiums. Pierre drives his car to work, so he purchased an annual staff parking permit for \$750.00. He pays for the permit by monthly payroll deductions, which are made at the end of each month.



Some dental assistants work only part time.

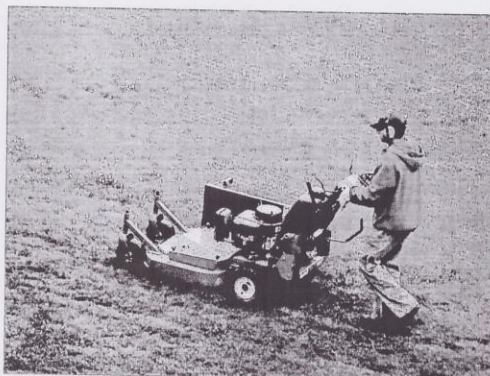
- a) On the 15th of last month, Pierre's take-home pay was \$1379.58. Was he paid the correct amount? Explain how you know.
- b) On the 31st of last month, Pierre's take-home pay was \$1254.58. Was he paid the correct amount? Explain how you know.

Extend your thinking

8. Gerry's employer has a dental plan for employees that covers Gerry, his spouse, and their child. The dental plan will pay 100% for routine checkups and cleaning and basic procedures such as fillings. It pays 70% for a crown and 65% for braces. One year, the following dental work is done:
 - each member of the family has a routine checkup and cleaning that costs \$165.00 for each person;
 - Gerry gets a crown that costs \$900.00; and
 - the child has a filling that costs \$125.00 and gets braces that cost \$4250.00.
 - a) How much is the total bill?
 - b) What amount will the insurance company pay?

PROJECT—A PAYROLL PLAN FOR A SUMMER BUSINESS

MAKE A PRESENTATION



This student worker has a busy summer ahead.

You are now ready to gather your information and documents and prepare a final presentation.

T Compile the materials you have prepared in a business-like presentation folder or binder or create a slideshow using presentation software. Be sure to include the following items:

- a paragraph that outlines your plan;
- **T** a spreadsheet or a table that contains a list of positions, the gross pay of each employee, deductions, and net pay, with a total payroll amount for the pay period;
- an equation that describes your regular weekly payroll costs;
- a sample pay statement for one employee, with a list of deduction amounts and a statement of net pay; and
- a memo you have written to your staff that describes the payroll policies.

REFLECT ON YOUR LEARNING

EARNING AN INCOME

Now that you have finished this chapter, you should be able to

- ☐ calculate gross pay given a rate of pay and amount of time worked;
- ☐ calculate total time worked from a weekly work schedule;
- ☐ describe various methods of earning income and give examples of jobs that fall into different categories;
- ☐ calculate earnings that combine a base salary plus commissions, bonuses, or tips;
- ☐ calculate income based on piecework;
- ☐ describe the advantages and disadvantages of a given method of earning an income, such as contract work, piecework, salary, or commission;
- ☐ determine CPP, EI, and income tax deductions for a given gross pay and calculate the net pay.

In addition, you have completed a project in which you have produced pay statements and payroll deductions in the context of a summer business.

PRACTISE YOUR NEW SKILLS

1. Tiffany works in a clothing store in Calgary. She earns \$1454.88 gross pay each month. If she works 40 hours a week, how much is her hourly rate?
2. The dining room at the faculty club at the University of Saskatchewan in Saskatoon has 5 waiters on a Thursday dinner shift and 6 on a Friday dinner shift. Their hourly wages are \$9.50 and they work 7 hours on Thursday and 6 hours on Friday. If the total tips are \$225.50 on Thursday and \$310.00 on Friday, on which night will the waiters earn more? Explain the steps in your solution.
3. Alex works as a crane operator in Langley, BC. His hourly rate of pay is \$21.00 and his regular work week is 40 hours.
 - a) If he works an extra 8-hour shift on Canada Day and his overtime rate is time and a half, what are his gross earnings for the holiday?
 - b) How much more is this than a regular day's pay?

4. Henri is a self-employed bricklayer. One month he had four contracts for \$1100.00, \$4500.00, \$2600.00, and \$925.00. The cost of materials was \$3850.00 and wages for himself and his part-time assistant were \$3200.00.
 - a) How much did the business earn for the month?
 - b) What are these earnings expressed as a percentage of the total contracts?
 - c) With this percentage of earnings, is this business likely to succeed? Explain.
5. Pierrette works as a salesperson in a car dealership in Kelowna, BC. She gets paid a base salary plus commission on each vehicle she sells. The commission is 25% of the profit the company makes on the sale. If Pierrette sells a new vehicle on which the markup was \$3500.00 but the customer negotiates \$1500.00 off the list price, how much commission will Pierrette earn?
6. Explain what information you need in order to calculate a person's net pay. What tools and/or equipment would you use to do the calculations?
7. Use the portions of the federal and provincial tax deductions tables shown here to answer these questions.

Federal tax deductions
 Effective January 1, 2008
 Biweekly (26 pay periods a year)
Also look up the tax deductions
in the provincial table

Pay		Federal claim codes/Codes de dem						
Rémunération		0	1	2	3	4	5	6
From	Less than	Deduct from each pay						
De	Moins de	Retenez sur chaque paie						
1088	- 1104	148.55	93.15	87.60	76.50	65.40	54.30	4
1104	- 1120	150.80	95.40	89.85	78.75	67.65	56.55	4
1312	- 1328	179.90	124.50	118.95	107.85	96.75	85.65	7
1328	- 1344	182.15	126.75	121.20	110.10	99.00	87.90	7
1344	- 1360	184.35	129.00	123.45	112.35	101.25	90.15	7
1360	- 1376	186.60	131.25	125.70	114.60	103.50	92.40	8
1376	- 1392	188.85	133.45	127.90	116.80	105.70	94.60	8
1392	- 1408	191.10	135.70	130.15	119.05	107.95	96.85	8
1408	- 1424	193.35	137.95	132.40	121.30	110.20	99.10	9
1424	- 1440	195.55	140.20	134.65	123.55	112.45	101.35	9
1440	- 1456	197.80	142.45	136.90	125.80	114.70	103.60	9
1456	- 1472	200.55	145.15	139.60	128.50	117.40	106.30	9
1472	- 1488	203.90	148.50	142.95	131.85	120.75	109.65	9

Alberta provincial tax deductions

Effective January 1, 2008

Biweekly (26 pay periods a year)

**Also look up the tax deductions
in the federal table**

Pay Rémunération	Provincial claim codes/Codes de déduction						
	0	1	2	3	4	5	
From Less than De Moins de	Deduct from each pay Retenez sur chaque paie						
1316 - 1332	124.20	62.05	57.50	48.45	39.35	30.25	2
1332 - 1348	125.70	63.55	59.00	49.90	40.85	31.75	2
1348 - 1364	127.20	65.05	60.50	51.40	42.30	33.25	2
1364 - 1380	128.70	66.55	62.00	52.90	43.80	34.70	2
1380 - 1396	130.20	68.05	63.50	54.40	45.30	36.20	2
1396 - 1412	131.70	69.55	65.00	55.90	46.80	37.70	2
1412 - 1428	133.20	71.00	66.50	57.40	48.30	39.20	3
1428 - 1444	134.65	72.50	67.95	58.90	49.80	40.70	3
1444 - 1460	136.15	74.00	69.45	60.35	51.30	42.20	3
1460 - 1476	137.65	75.50	70.95	61.85	52.75	43.70	3
1476 - 1492	139.15	77.00	72.45	63.35	54.25	45.15	3
1492 - 1508	140.65	78.50	73.95	64.85	55.75	46.65	3
1508 - 1524	142.15	80.00	75.45	66.35	57.25	48.15	3
1524 - 1540	143.65	81.50	76.95	67.85	58.75	49.65	3
1540 - 1556	145.15	82.95	78.40	69.35	60.25	51.15	3

- If a hotel reservations clerk in Banff, AB earns \$1392.00 biweekly and his TD1 claim code is 2, how much federal tax will be deducted from each pay?
 - How much provincial tax will be deducted from each pay?
 - If this worker earned the same amount in Fernie, BC, what information would you need to determine whether the deductions would be different?
- Chandra works as a flight dispatcher at the Calgary airport. Her annual salary is \$37 000.00 and her TD1 claim code is 2.
 - Calculate her biweekly gross pay.
 - What will her deductions be for CPP, EI, and income tax for each pay period? Use the federal and provincial tax tables shown above.
 - What will her net pay be?
 - Would you rather work on a straight commission basis or a salary plus commission basis? Why? What are the advantages and disadvantages of each?