MATH *ON THE JOB*

The banks of the Kennebecasis River near Bloomfield, New Brunswick, border Evelyn Cassidy's dairy farm and her Farm Stay Bed and Breakfast. Evelyn is the self-employed owner and operator of these businesses.

Evelyn makes a point of taking courses that contribute to her skills as a host and businessperson. She has studied agriculture, French, computer programs, cooking, and risk management and outdoor adventure. She has attended New Brunswick Community College, the University of New Brunswick, and is a graduate of Hampton High School.

"Being self-employed, I have to do every job involved in my work. I use math all the time," Evelyn says. For example, she must calculate costs, prices, profit, guest bills, and staff wages.

Suppose Evelyn hires two part-time employees, one to help her guide tours and one to help her with cooking and cleaning for the bed and breakfast. Each person works 5 days a week. The guide makes $10.50 an hour and works 15 hours per week. The cook/cleaner works for 25 hours in one week and makes a total of $268.75 before taxes. How much will Evelyn pay the tour guide for one week's work? What hourly wage will Evelyn pay the cook/cleaner?

Evelyn in the kitchen of her Farm Stay Bed and Breakfast. Evelyn also runs tours on her dairy farm where participants have the chance to sample dairy products, learn how to milk a cow, and feed a calf.

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a) Pay $= \$10.50/hr \times 15\,hrs$

      $= \$157.50$

b) Hourly Wage $= \dfrac{268.75}{25}$

      $= \$10.75$

SOLUTION

To calculate the tour guide's weekly earnings, multiply the number of hours worked by the rate of pay for the job.

15 h × $10.50/h = $157.50

The tour guide will earn $157.50 in one week, before taxes.

To calculate the cook/cleaner's hourly wage, divide the weekly amount earned by the number of hours worked.

$268.75 ÷ 25 = $10.75

The cook/cleaner earns an hourly wage of $10.75.

Minimum Wage

the minimum amount a worker

b

this

Gross Pay

the total amount
of money earned
(pay before deductions)

Overtime

work beyond a normal
work week (40 hours)

Rates...
- time and a half: your regular rate plus half of your
                         regular rate (Rate x 1.5)
- double time: double your hourly rate (Rate x 2)
- triple time: triple hourly rate (Rate x 3)

Wages & Salaries

Page 55

Check out the **pay statement**
on page 55
and answer questions 1 to 4.

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:	Pay Begin Date:	10/13/2011
ABC Elevator Repair	Pay End Date:	10/19/2011

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? *Paid a lot more!*

4. Develop a formula Jolie could use to calculate her earnings for any given pay period.
   Earnings = $19.00/hr × hours worked

Handwritten notes:
$1-7 = 7-1$ should be 7
$= \boxed{6}$ ADD ONE
$13-19 = 6+1$
$= 7$ days

$\dfrac{\$712.50}{\$19/hr} = 37.50 \, hr$

SOLUTIONS
???
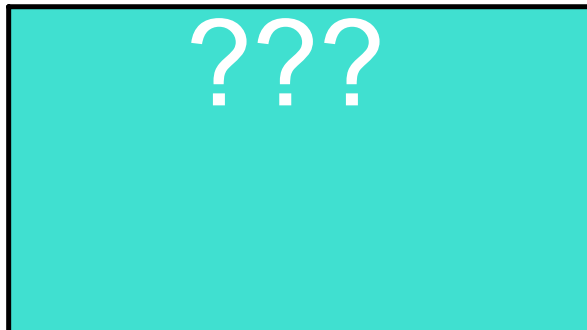
EX #1: Each summer, Rick works at a home show in Halifax as a parking lot attendant. His wages this year are $9.76 an hour and his hours of work vary from week to week. He worked 25 hours for the week August 14–20 and 35 hours for the week August 21–27.

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

Employee Name: Rick		
Company: Nova Scotia Spring Ideal Home Show	**Pay Begin Date:** 14/08/2011 **Pay End Date:** 27/08/2011	

General		
Employee ID: 999999	**Job Title:**	Parking lot attendant
Address:	**Pay Rate:** **Annual:**	$9.76/h

Hours and Earnings			
Description	**Rate**	**Hours**	**Gross Earnings**
Regular	$8.76 *9.76*	60	$525.60 *$585.60*

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?
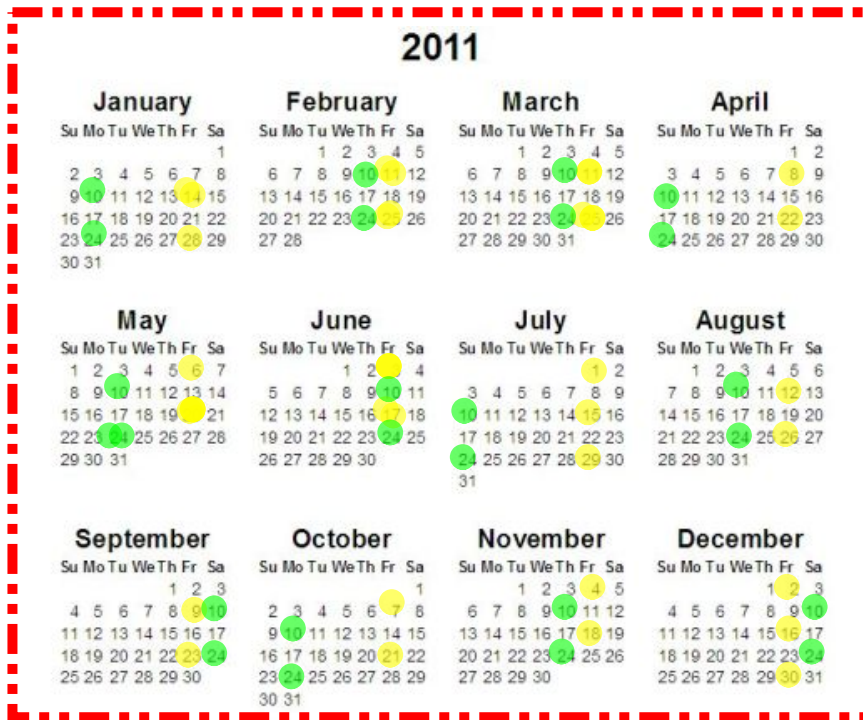
hourly
daily
Weekly *
biweekly
semimonthly
monthly
Yearly

Piecework

SOLUTIONS

1. People can be paid weekly, biweekly, semi-monthly, monthly, daily, hourly, annually, by contract, on commission, and by piecework.

2. Answers will vary. Examples of daily, hourly, or weekly paying jobs include temp work, administrative jobs, part-time work, and construction jobs. Examples of biweekly, semi-monthly, and monthly paid jobs include full-time work, retail jobs, administrative work, teaching, and clerical positions. Jobs paid on a piecework basis include delivering newspapers or flyers, manufacturing, sewing, floor installation, and cabinet installation. Commission based jobs include retail sales, car sales, and selling real estate. Contract work includes house painting and construction.

3. Answers will vary. One advantage to weekly pay is having more pay periods a year (52 rather than 12). Another advantage is that you would be paid sooner when you start a new job. One reason most workers are not paid weekly is because it would be expensive for a company to have to process payroll payments every week.

4. Most people who work on an annual salary don't get paid overtime. In some cases, an employer may offer time off in lieu of overtime pay.

Salaries

- a fixed amount of money that is paid over one year.
- daily pay periods - salary divided by 365
- weekly pay periods - salary divided by 52 weeks
- bi-weekly pay periods - salary divided by 26
- semi-monthly pay periods - salary divided by 24
- monthly pay periods - salary divided by 12
- quarterly pay periods - salary divided by 4

2011

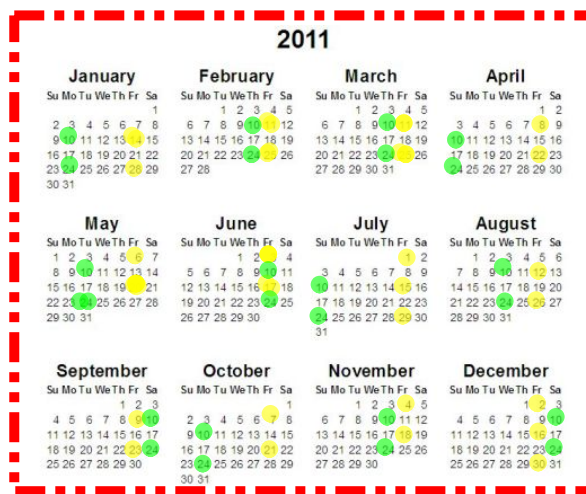| January	February	March	April

May June July August

September October November December

What is the difference?

$\frac{52}{2}$

→ Biweekly

Paid every two weeks.   26 pays

$\frac{12}{2}$

Semi-monthly

Paid twice a month.   24 pays

2011 calendar

What is the difference?

Biweekly

Paid every two weeks.   26 pays

semi-monthly

Paid twice a month.   24 pays

$$\frac{\text{52 weeks in a year}}{2}$$

= 26 pays

12 months x 2

= 24 pays

EXAMPLE #2...

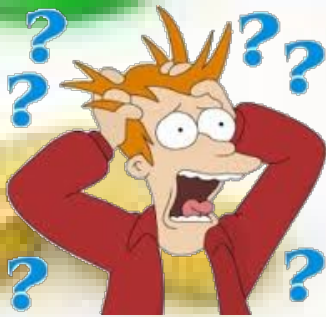Amos was hired to be the office clerk at an insurance company. His annual salary will be $34 756.00.

a)   Why is Amos not paid annually for his work?

b)   Would he earn more each pay period if he were paid **semi-monthly** or **biweekly**?

Semi-monthly: $\dfrac{\$34\ 756.00}{24}$ Biweekly: $\dfrac{\$34\ 756.00}{26}$

$1448.17 $1336.17

How many weeks are in a month??

I always thought there were 4!!

$$\frac{52 \text{ weeks}}{12 \text{ months}} = 4.\overline{3} \text{ wk}/\text{month}$$

How many weeks are in a month??

$$\frac{52 \text{ weeks in a year}}{12 \text{ months}}$$

4.33 weeks / month

EX #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?

"time and a half"

$9.86/hr × 1.5 = $14.79/hr

$14.79/hr × 8hrs = $118.32

O.T. Pay

b) What is her hourly rate on the holiday?

EX #4:

Gregor works as a glazier, a person who cuts and fits glass, at a window manufacturing company in Miramichi, NB. 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.
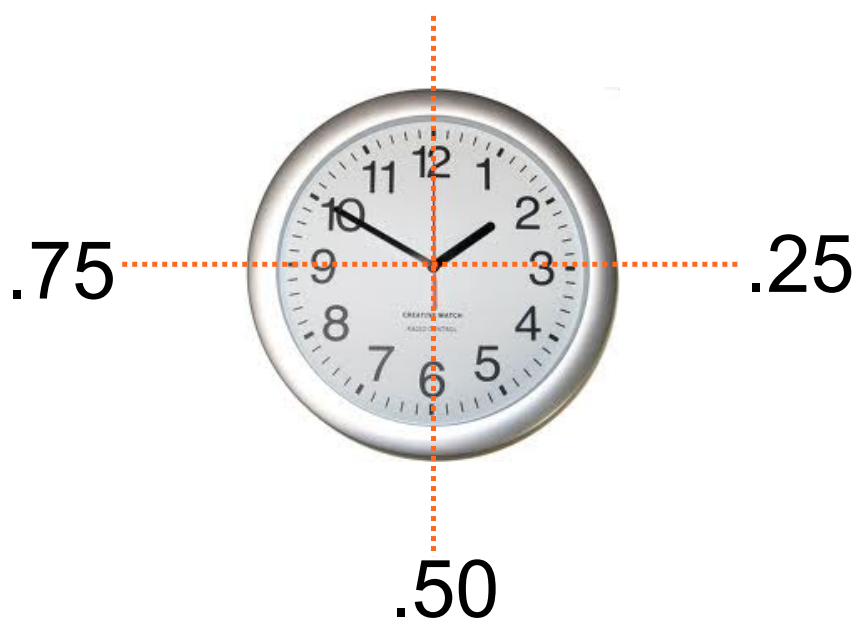
WEEKLY SCHEDULE

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

Ritchie Wharf Park is a popular tourism destination for those visiting Miramichi, New Brunswick.

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?

.75   .25

.50

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

Gregor works as a glazier, a person who cuts and fits glass, at a window manufacturing company in Miramichi, NB. 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	= 8 hours
	Tuesday	8:15 am	4:00 pm	= 7.75 hours
	Wednesday	8:00 am	3:30 pm	= 7.5 hours
	Thursday	8:00 am	4:00 pm	= 8 hours
	Friday	9:00 am	4:15 pm	= 7.25 hours
	Saturday	8:30 am	6:30 pm	=10 hours

48.5 hours

a) Describe your strategy for determining the number of hours Gregor will work each day and express these amounts as decimals.

.75 ········ ·········.25

b)

48.5 hours - 37.5 hours = 11 hours of overtime   .50

$$Reg\ Pay = \$19.99/h \times 37.5\ hrs$$
$$= \$749.63$$
$$O.T.\ Pay = 11 \times (19.99 \times 1.5)$$
$$= \$329.84$$

$$Total\ Pay = 1079.47$$

ONE LAST EXAMPLE...

Liberty works as a plumber. She receives $24.50/hr plus time and a half for the first 8 hours of overtime and double time for anything beyond that time. If she has worked a 50 hour week, what is her gross pay?

Reg Pay $24.50/hr × 40 = $980.00

O.T. #1   ($24.50/hr × 1.5) × 8 = 294.00

O.T #2   ($24.50/hr × 2) × 2 = 98.00

Total Paycheque............ $1372.00
(Gross Pay)

JOBS AND CHORES THAT REQUIRE MATH

Job/chore	Math used
retail sales	calculating purchase amounts, including taxes and discounts
restaurant worker	calculating tips
working at an amusement park	counting tickets, making sales, estimating wait times
stocking shelves	calculating how much stock fits on shelves and how much a dolly can carry at one time
newspaper delivery	using reason and logic to determine the best routes, estimating how long delivery takes
cooking	measuring ingredients, calculating timing
cleaning	measuring cleaning products, mixing solutions
laundry	measuring detergent, telling time

HOMEWORK...
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Questions 1 to 10

2.1 Build Your Skills Detailed Solutions.pdf

Attachments

2.1 Build Your Skills Detailed Solutions.pdf