Using a Spreadsheet

You will need
- a spreadsheet program
- a calculator

▶ **GOAL**

Use a spreadsheet, and understand the difference between a spreadsheet and a database.

Learn about the Math

Heidi is organizing a pizza lunch for her school. Each class has given her a form that shows the total number of slices of pizza and drinks.

Heidi uses a **spreadsheet** program on a computer. She enters the data for each class in the **cells**, as shown below. She uses a **formula** to calculate the total number in a column.

	A	B	C	D	E	F	G	H
1	Class	Pepperoni	Mushroom	Cheese		Orange	Cola	Root Beer
2	8A	15	7	5		7	9	11
3	8B	13	12	2		9	14	4
4	8C	8	14	7		6	12	11
5	7A	10	8	12		2	15	13
6	7B							
7								
8	Total	46	=sum(C2:C7)	=sum(D2:D7)		=sum(F2:F7)	=sum(G2:G7)	=sum(H2:H7)
9	Number of whole pizzas	=B8/8	=C8/8	=D8/8	Number of cases of pop (12 cans per case)	=F8/12	=G8/12	=H8/12

? How can you determine the total order for the school?

A. What information is found in column G? in row 3?

B. What data is in cell F4? in cell H5? in cell B8?

C. Describe how to enter the following data for class 7B: Cheese 7, Pepperoni 13, Mushroom 10, Root beer 5, Cola 12, Orange 13.

D. Each formula shown in red is hidden on the screen. It is automatically replaced by the calculated result after you enter a formula. This has already happened in cell B8. What formula was entered to give this result? Calculate the other results that will appear in row 8.

E. Each cheese pizza has 8 slices. How is this information used in row 9? Calculate the results that will appear in row 9.

F. If class 8C wants to change its order to 10 mushroom pizzas, how will this change the totals? What is the only change you have to make to the spreadsheet to change the order for the school? Explain.

spreadsheet

an orderly arrangement of numerical data using rows and columns; computerized spreadsheets can use formulas to perform calculations with the data

cell

the intersection of a column and a row, where individual data entries are stored; for example, cell B2 shows the entry in row 2 and column B

formula

calculations made within a cell using data from other cells; formulas may vary depending on the spreadsheet program used; for example, the formula for cell C8 is =sum(C2:C7), which tells the program to add the numbers in column C from row 2 to row 7

Reflecting

1. As soon as Heidi entered a value into cell B6, the number in B8 changed. Why did this happen?

2. How can Heidi use the spreadsheet to determine the total order for the school?

3. Heidi noticed that the spreadsheet looked like a database in some ways. What can you do on a spreadsheet that you cannot do on a database, even if they both contain the same information?

Work with the Math

Example 1: Scheduling employees

Shane's employer uses the following spreadsheet to schedule the employees.

a) How many hours will Shane work this week?

b) Use the graphing button to create a bar graph that compares the hours the employees will work this week.

	A	B	C	D	E	F	G	H	I
1	Employee	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total hours
2	Meghan	0	7	7	0	8	8	0	=sum (B2:H2)
3	Ahmed	4	0	0	4	7	7	0	=sum (B3:H3)
4	Shane	5	8	4	0	0	4	4	=sum (B4:H4)
5	Natasha	7	0	0	7	0	0	7	=sum (B5:H5)
6	Tien	0	4	8	8	0	0	8	=sum (B6:H6)
7	Dustin	4	4	0	0	4	4	0	=sum (B7:H7)
8	Tim	0	0	4	4	4	0	4	=sum (B8:H8)
9	Total	=sum (B2:B8)	=sum (C2:C8)	=sum (D2:D8)	=sum (E2:E8)	=sum (F2:F8)	=sum (G2:G8)	=sum (H2:H8)	=sum (I2:I8)

James's Solution

a) After I entered the formula in column I, the program automatically added all the data in row 4 and showed 28 in cell I4. So Shane will be working 28 hours this week.

b)
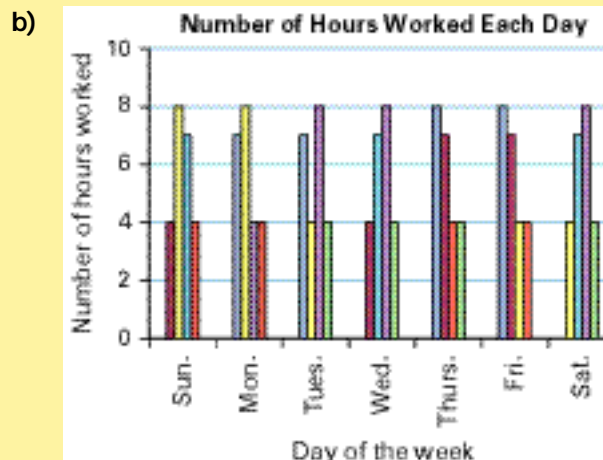
To create a bar graph, I highlighted all the hours worked, but not the totals. Then I chose the bar graph option in my spreadsheet program. When the screen opened, I selected "Column Graph." Then I selected "Titles" to add a title for the graph and for each axis.

This is my legend:

□ Meghan   ■ Ahmed   □ Shane   ■ Natasha
■ Tien   ■ Dustin   □ Tim

Example 2: Recalculating salaries

Create a new column, J, to calculate how much each employee in Example 1 will earn if the salary is $8.00 per hour.

Solution

To calculate the employees' salaries, create column J. Highlight the column and press the $ button to change the amounts to dollars. Then enter the formula J=I*8. This formula multiplies the total number of hours, as listed in column I, by $8. Remember that the * key means multiply.

Ⓐ Checking

4. a) If Shane's hours are changed from 0 to 9 on Wednesday (cell E4), which cells will change automatically?

b) What will be the new values in these cells?

c) Explain how you would change column J if all the employees got a 50¢ per hour raise.

Ⓑ Practising

5. The following spreadsheet shows the pet populations in selected countries.

	A	B	C	D	E	F
		Human population	Dogs	Cats	Reptiles	Small mammals
1	Country	(millions)	(millions)	(millions)	(millions)	(millions)
2	U.S.	278.1	69.3	75.1	7.7	13.1
3	China	1273.0	20.4	40.0	0.6	1.5
4	Russia	145.5	9.5	12.5	4.5	4.5
5	France	59.6	8.1	9.0	1.1	1.8
6	Italy	60.0	7.4	9.2	1.1	1.2
7	U.K.	59.6	6.5	8.0	1.7	3.7
8	Canada	31.6	3.8	4.8	0.19	1.1

a) State what is shown in
  i) column E   **iii)** cell E5
  ii) row 5   **iv)** cell B8

b) Which country has the most pet dogs?

c) Explain how you could find the total number of pets (in millions) for each country using a calculator. What formula could you use on a computer?

d) Explain how you could find the mean number of pets per person for each country using a calculator. What formula could you use on a computer?

e) Use a computer to create a graph that shows the number of pet reptiles in the different countries.

6. Six Grade 7 students recorded how many hours they watched television during one school week.

	A	B	C	D	E	F	G	H
1	Student's name	Monday	Tuesday	Wednesday	Thursday	Friday	Total	Mean
2	Rob	2	1.5	1.5	4	5		
3	Juana	2	2.5	2	2.5	4		
4	Bar	1.5	1	1.5	2	3.5		
5	Christine	0	2.5	2.5	3	3.5		
6	Carrence	4	4	5.5	4	4.5		
7	Tyler	3	0	5	4.5	4.5		
8	Total							
9	Mean							

a) Copy and complete the spreadsheet.

b) What information is given in cell G5?

6. c) What formula did you use to calculate the value for cell D9?

   d) Use your data to create a graph for the school newspaper. Explain why your choice of graph suits the data.

   e) Change the data for Cameron (row 6) to the following: Monday 5 h, Tuesday 5 h, Wednesday 0 h, Thursday 5 h, Friday 0 h. Which daily mean has the greatest change?

7. This table shows sales at Johnny's Hot Dog Stand.

Price of item	Sales						
	M	T	W	T	F	S	S
hot dog $2.00	57	62	48	62	87	130	114
sausage $3.00	33	23	21	39	50	64	50
soft drink $1.50	40	58	55	75	92	132	108
chips $1.50	12	18	7	20	12	37	34

   a) Use the data to complete the following spreadsheet. (The first row has been done for you.)

   b) Johnny wants a day off. Which day would be best, based on these daily sales?

   c) How much did Johnny collect in sales for the week?

   d) Create a graph to display the week's hot dog sales. Which type of graph did you use to show this information? Why?

8. Describe how a spreadsheet can be used in your favourite sport or hobby. What categories of information would be included? Why?

❻ Extending

9. A school has a vending machine that sells water, orange juice, apple juice, and grapefruit juice. Over the years, the school has found that the ratio of water to orange juice to apple juice to grapefruit juice sold is $5:6:8:1$.

   a) If a total of 100 drinks are sold each week, how many apple juices are sold?

   b) Make a computer spreadsheet to help the school order the correct number of drinks. If a number is entered into any drink column (as shown below), your spreadsheet should automatically update to show how many other drinks to order, as well as the total number of drinks to order.

   c) Use a formula to calculate the percent of each kind of drink sold.

	A	B	C	D	E	F
1		Water	Orange juice	Apple juice	Grapefruit juice	Total drinks
2	Week 1	50				
3	Week 2		66			
4	Week 3			40		
5	Week 4				14	

10. Use the data in question 7.

   a) What is the ratio of the total number of hot dogs sold during the week to the total number of sausages sold? Use your ratio to decide how many hot dogs Johnny should order next week, if he orders 300 sausages.

   b) What is the ratio of the number of soft drinks sold to the number of chips sold? If Johnny sells 300 soft drinks next week, how many chips will he probably sell?