

## Activity 1

### Objectives

- Set up a spreadsheet in the CellSheet™ Application
- Use the CellSheet App to determine the mean of a set of values
- Use the CellSheet App to find the minimum value to obtain a given mean

## What Is Your Grade? (Part 1)

### Introduction

It is time for the last test of the marking period. You really want to have an 86% test average for the marking period. What score will you have to get on this last test in order to have the average you want?

In this activity, you will keep track of your test scores in your courses and will determine what score you need on a test in order to get the grade you want.

You have most likely learned how to calculate the mean, or average, of a set of values. Remember that the mean is calculated by adding all the values in the set and dividing that sum by the number of values:

$$\text{Mean} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n} = \frac{\text{sum of all the values}}{\text{number of value entries}}$$

### Problem

On the four tests taken so far this marking period, your scores have been 85%, 76%, 93%, and 82%. What score will you need to get on the fifth test in order for your test average to be 86% for the marking period?

To help you solve this problem, you will create a CellSheet template. A CellSheet template has a spreadsheet format and is made up of *columns*, which are labeled by letters and *rows*, which are labeled by numbers. The intersection of a column and a row is a *cell* and is defined by a letter and number (for example, cell A1).

### Exploration

To use the CellSheet App, press **[APPS]**. From the **APPLICATIONS** list, select **CellSheet**.

Press any key to bypass the Introduction screen. The Help screen appears and lists important keystroke information for inputting cell information and navigating the spreadsheet page. Press any key again. If there are no spreadsheets already saved on

your handheld, a new spreadsheet appears on the screen. If there are spreadsheets already saved on your handheld, CellSheet opens the file that was most recently used. Directions for starting a new file are shown in step 1 of this activity.

You can move from one cell to another with the cursor keys (↑ ↓ ← →). The cell in which the cursor is located is identified in the lower left portion of the screen, as well as the contents of that cell. If you move the cursor into the leftmost column, the entire row is highlighted. If you move the cursor to the top of the screen, an entire column is highlighted.

A cell may contain text, numerical values, or formulas. For cell entries that should appear as text, start with a quotation mark ([ALPHA] ["]). To enter letters in the cell, press [2nd] [A-LOCK] to lock on the alpha characters. Numbers may also be entered as text by pressing [ALPHA] to unlock the alpha characters. Formulas may be entered into the cell by pressing [STO▶] to insert an equal sign and typing the formula. To complete the input in any cell, press [ENTER].

1. Locate the **Menu** icon at the bottom right of the screen. Press [GRAPH] to open the **Menu**. Select **File > New**. Name the new program **GRADES1**. Press [ENTER] two times.

GRAD	A	B	C
1			
2			
3			
4			
5			
6			
A1:			[Menu]

2. Move the cursor to cell A1. Press [2nd] [A-LOCK] ["] **AVG** [ENTER] to enter the heading **AVG**.

GRAD	A	B	C
1	AVG		
2			
3			
4			
5			
6			
A2:			[Menu]

3. Move the cursor to cell B1 and enter the first test grade, **85**. Move to cell B2, and enter the second grade, **76**. Enter the third grade, **93**, in cell B3, and the fourth grade, **82**, in cell B4. Move to cell A5, type "TEST 5 and press [ENTER].

GRAD	A	B	C
1	AVG	85	
2		76	
3		93	
4		82	
5	TEST 5		
6			
A6:			[Menu]

4. Move to cell A2, where you will enter a formula that will compute the average of all five tests. Even though you have not yet taken the fifth test, you want to include that in your formula.

Type the formula  $=\text{(B1+B2+B3+B4+B5)}/5$  in cell A2. Press **[ENTER]**.

As you can see, the average is 67.2, but keep in mind that you have not entered a fifth test score. The mean was calculated with a fifth test score of zero.

GRAD	A	B	C
1	AVG	85	
2	67.2	76	
3		93	
4		82	
5	TEST 5		
6			
A2:			[Menu]

5. To enter a fifth test score, move to cell B5. Enter a value. Type **70** for the first sample. The mean is automatically recalculated when you press **[ENTER]**. (If the mean is not recalculated, go to **Menu > File > Format** and set **AutoCalc** to Y.)

If you get a 70% on the fifth test, your average will be 81.2%, not quite 86% that you were hoping to have.

GRAD	A	B	C
1	AVG	85	
2	81.2	76	
3		93	
4		82	
5	TEST 5	70	
6			
B6:			[Menu]

6. Enter other values in cell B5 to find out how your average will change. Try 80 and 90. Keep entering different values until you get a mean of 86. What value produced a test score of 86?

GRAD	A	B	C
1	AVG	85	
2	83.2	76	
3		93	
4		82	
5	TEST 5	80	
6			
B6:			[Menu]

GRAD	A	B	C
1	AVG	85	
2	85.2	76	
3		93	
4		82	
5	TEST 5	90	
6			
B6:			[Menu]

7. Now that you know what score you will need on the fifth test to get 86% for the marking period, find the lowest score you can earn on the fifth test to get an 80% average.

Is it possible to get a 94% average? If so, what score will you need to have a test average of 94%? If not, what is the highest your test average can be?

# Student Worksheet

Name \_\_\_\_\_

Date \_\_\_\_\_

## ***Navigating the CellSheet™ Application***

1. You have learned some things about the CellSheet App. You know that the spreadsheet is made up of \_\_\_\_\_, denoted by letters, and \_\_\_\_\_, denoted by numbers.
2. The intersection of a column and a row is called a \_\_\_\_\_.
3. When typing text, always start with a \_\_\_\_\_. When typing a formula, start with \_\_\_\_\_ by pressing \_\_\_\_\_.

## ***Solving the Problem***

4. In order to have an average of 86%, your score on the fifth test must be at least \_\_\_\_\_.
5. In order to have an average of 80%, your score on the fifth test must be at least \_\_\_\_\_.

## ***Analyzing the Data***

6. Using the data from the Exploration, complete the table below.

<b>Fifth Test Grade</b>	<b>Mean</b>
70%	
80%	
90%	
94%	

7. Look at the data in the table. What happened to the mean as the score on the fifth test changed? What pattern can you see?  
\_\_\_\_\_
8. How can you explain the pattern? \_\_\_\_\_  
\_\_\_\_\_
9. Try scores lower than 70%. Will the same pattern continue? Why or why not?  
\_\_\_\_\_  
\_\_\_\_\_

10. The first four test grades for Albert were 66%, 69%, 75%, and 88%. Find the lowest score Albert can earn on the fifth test to have a 75% average. What score would Albert need to have an average of 85%?

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11. The first four test grades for Rosa were 99%, 92%, 93%, and 95%. Find the lowest score Rosa can earn on the fifth test to have a 94% average. What is the lowest score Rosa can earn to have an 85% average? Can Rosa have a 75% average? A 70% average? Explain your answers.

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### ***Extending the Activity***

- Create a new template to find the mean of six test grades. Edit the formula in cell A2 to include the sixth test score. What will the new formula be?
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- Enter five test scores: **78, 82, 83, 74, and 89**. What score is needed on the sixth test to have an average of 84%? What score is needed on the sixth test to have an average of 80%?

Sixth Test Grade	Mean
	84%
	80%

- Fill in the table to help you determine the pattern.

Sixth Test Grade	Mean
70%	
80%	
90%	
100%	

How can you represent the pattern mathematically? \_\_\_\_\_

4. Jin Lee, a salesperson for HiJinx Parts, has an average monthly sales quota of \$25,000 for the first six months of the year. The table below shows his sales figures for the first five months:

<b>Month</b>	<b>Sales</b>
January	\$24,470
February	\$20,220
March	\$16,520
April	\$27,590
May	\$23,440

What is the minimum amount of sales that Mr. Lee needs in June in order to meet his average monthly quota of \$25,000? \_\_\_\_\_

## Teacher Notes



### Activity 1

## What Is Your Grade? (Part 1)

### Objectives

- Set up a spreadsheet in the CellSheet™ Application
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### Materials

- TI-84 Plus/TI-83 Plus

### Time

- 60 minutes

### Preparation

To get students interested, talk about grades. How important are grades? Ask students how their English or history teacher determines grades for the marking period. Ask how many can figure out what scores they would need to earn on a test in order to get the grades they want on their report cards.

Present students with a hypothetical situation. Consider the grades of these two students and determine who has a better chance of earning a 78% test average, based on their scores on five tests.

Student 1: 70, 70, 70, 80

Student 2: 55, 65, 75, 95

### Elicit Questions

Some preliminary questions may get students to think about how they would know what test score they would need to earn in order to have a certain grade at the end of a marking period. Initiate the discussion by asking questions of the following nature: Who knows what your current average in (a given course) is? How do you keep track? Imagine your parents have promised you a reward if you earn an A in math. How could you find out what scores you need to get on the next exam?

### Management

Students should be encouraged to work individually to complete the activity. However, you may want to allow students to seek assistance from their classmates, depending on students' level of comfort using a graphing handheld. You may want to pair up students who are not very proficient in English with classmates more fluent in English.

## Answers to the Student Worksheet

### *Navigating the CellSheet™ Application*

1. Columns; rows
2. Cell
3. "[ALPHA] ["]; = ; [STO▶]

### *Solving the Problem*

4. 94%
5. 64%

### *Analyzing the Data*

6.

<b>Fifth Test Grade</b>	<b>Mean</b>
70%	81.2%
80%	83.2%
90%	85.2%
94%	86%

7. As the score increased by 10 points, the mean increased by 2 points.
8. The sum of all the scores is divided by 5 to get the mean. A one-point increase in a test score will result in a  $\frac{1}{5}$ -point increase in the average. Thus, a 10-point increase will result in a  $\frac{10}{5}$  or a 2-point increase in the average.
9. Yes. The pattern will continue because the divisor is still five.
10. If Albert scores a 77% on the fifth test, he will have a test average of 75%. It is mathematically impossible for Albert to have an 85% average. A score of 100% on the fifth test gives Albert a 79.6% average.
11. A score of 91% or better on the fifth test gives Rosa a test average of 94%. A score of 46% on the fifth test gives Rosa a test average of 85%. The lowest test average Rosa can have is 75.8% and that is only if she gets a score of 0% on the fifth test.



**Extending the Activity**

1. The new formula is  $=(B1+B2+B3+B4+B5+B6)/6$ .

2.

Sixth Test Grade	Mean
98%	84%
74%	80%

3.

Sixth Test Grade	Mean
70%	79.333%
80%	81%
90%	82.667%
100%	84.333%

For six grades, the sum of the grades is divided by 6. Thus, any one point means an increase in  $\frac{1}{6}$  of a point. A 10-point increase will result in  $\frac{10}{6}$  or 1.667 points increase, not two points.

4. June sales need to be at least \$37,760 (rounded) in order for Mr. Lee to average \$25,000 per month in sales for the six-month period.