
" New Year, new products! HP Calculators launched three new products at CES. Meet the new editions and see how these calculators are there for you at every stage of your life.

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Your articles

" RPN Tip \#11
This month's RPN tip can show you the easiest way to use your calculator as a counter. Learn how here.
» Customer Corner: meet an HP Calculator user
Meet John Crane, a proud owner of over 15 HP
Calculators. His unique interest to learn and use new technology led him to create software for HP calculators and eventually to his career at NASA. Learn more about him.

» Matching data and graphs You're given a set of numbers and told to make sense of them, but how? Your HP Calculator and these instructions and help you show your data graphically. (Perfect for middle grade activities!)
» HP CES Calculator trivia This year HP introduced three new calculators at the Consumer Electronics Show, CES, adding to the 92 models announced over the last 37 years. Learn other HP Calculator facts here.

## Volume 11 February 2009

Welcome to the eleventh edition of the HP Solve newsletter. Learn calculation concepts, get advice to help you succeed in the office or the classroom, and be the first to find out about new HP calculating solutions and special offers.

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## New Year, New Products! HP Calculators launched three new products at CES

HP Calculators have been working hard to provide calculating solutions for all stages of life. In January, at the Consumer Electronics show, HP released three more calculators: the EasyCalc 100, the SmartCalc 300 and the OfficeCalc 300.


## Quick and easy - for classroom, home and office

This simple calculator is ideal for basic math and everyday calculations. Add, subtract, multiply, and divide, with big comfortable buttons. Just the keys for basic math functions, so it's easy to learn! It's small and easy to carry in a backpack - or your briefcase or purse. It's bright and attractive for classroom, home or office. Energy-wise solar power with a battery backup and it powers off automatically.

SmartCalc 300


## You do the math, we show the expression

Math and science students will appreciate the logical, accurate, and dependable HP SmartCalc 300s Scientific Calculator. Besides showing the result, the impressive Textbook Format Display (TFD) shows the math expression onscreen, just like it would appear on paper. Use the intuitive navigation pad to move around within an expression to change it and watch the result. With 249 built-in functions, students can solve an abundance of math problems from basic to complex.

OfficeCalc 300


## Meet your new office assistant -- elegant and smart

Beautify your desk or sales counter with the smart and elegant HP OfficeCalc 300. Adjust the tilt of the large 14 -digit screen to view your work easily and comfortably. Save time by using the innovative "Check and Correct" function and other important features like tax, markup, and percent. You get all this in a stylish design that's energy-efficient and enhances your workspace.

## Look for these products coming soon!

## RPN Tip \#1 1

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In HP Solve volume five the problem of using an RPN calculator as an event counter was described. The solution was to fill the stack with ones and the counting was performed by pressing the + key - utilizing the replication feature of the $T$ register and adding one with each + key press.

Many RPN machines have statistics functions and this feature is obvious with a summation $(\Sigma+)$ key on the keyboard. Efficient problem solving is a hallmark of RPN and the "counter" RPN Tip in volume five required six keystrokes to set up the counter.

An alternate counter solution is to use the $\Sigma+$ key of RPN the statistics software. The $\Sigma+$ key adds data to the accumulated statistics registers and the display shows a count of how many data have been entered.

Additionally the $\Sigma$ - function may be used to decrement the counter. Table 1 compares the two methods.

## Table 1 - Comparing Two RPN Counter Methods

| Process | HP Solve V5 | Statistics Counter |
| :---: | :---: | :---: |
| Set up | $1, \uparrow, \uparrow, \uparrow, \mathrm{CHS}(+/-)=6 \mathrm{ks}$. | $\rightarrow$, CLEAR, $4=3 \mathrm{ks}$. |
| Counting up | $+\quad=1 \mathrm{ks}$. | $\Sigma+\quad=1 \mathrm{ks}$. |
| Counting down | $1,-\quad=2 \mathrm{ks}$. | $\leftarrow, \Sigma-\quad=2 \mathrm{ks}$. |

Click here to learn more about RPN.
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Meet John Crane of Texas, a connoisseur of vintage (and modern) technology and a proud owner of the following HP Calculators:

- HP-67
- HP-65
- HP-21
- HP-22
- HP-27
- HP-29c
- HP-25c
- HP-25
- HP-19c
- HP-97
- HP-80
- HP-70
- HP-45
- HP-35
- HP-41cx
- HP-33c
- HP-32c
- HP-33s
- HP-48gx
- HP-35s

When the HP Solve team met with John, we were very impressed by his wisdom, life, and professional experience. He has a very unique interest to learn and use new technology while preserving and continuing to use vintage technology at the same time. In fact, his long time hobby of restoring and developing spare parts for vintage computer systems has turned into a business that keeps him busy in retirement. His business is called Gennai Corporation and you can send John an email (john_crane_59@yahoo.com) if you want to learn more. Very cool!

John's first HP Calculator was the HP-67. While attending high school in the 70s, he had taken an interest to astronomy and decided to take class at the local college. The professor had an HP21 in the classroom for students to use. This was the first time that John had laid eyes on an HP Calculator and it was love at first sight. His professor quickly noticed John's fascination with the calculator and brought in his personal HP-65 from home to give John a test drive. It was then that John decided he had to have an HP Calculator of his own. He joined a HP Calculator user group (long before the internet) and bought a used HP-67 from one of the other members.

With his HP Calculator in hand, there was nothing holding John back from exploring the world and technology. His HP-67 traveled with him around the world and even helped while studying abroad in Cairo, Egypt. By this time, he had become a professional at creating programs on his HP-67 for anything with a quantifiable result. John quickly learned that it made sense to program
and store the equations he created on his calculator for future use. And to our surprise, the magnetic memory cards that he programmed and stored while in Egypt still work to this day for his HP-67. He recalls creating programs for linear thrust curves for model rockets at that time. Unfortunately, his calculator couldn't help much with the archeology classes.

After college, John had an impressive professional career and always involved himself with cutting edge technology. He spent some years working for NASA where he created an early version of a GPS receiver. To test the accuracy and component values of the GPS receiver and validate the angle of the satellites, John used his HP-67 to make sure the device was accurate and working properly. WOW! Now you know who to thank when programming your navigation system in your fancy car.

It is all smiles for John when he thinks of HP. He is a long time fan of HP technology and has supported HP all along the way. He admires HP's commitment to innovation, quality, and customer service. He remembers when he acquired an HP-25c without an instruction manual. When he contacted HP Customer Care, they informed him that the manual was out of print and were not sure if they could help. Anyway, they took his information and said they would see what they could do. A few days later, John received a package in the mail of photocopies of the entire HP-25c manual. John was very thankful that HP took care of him. Even if it meant that someone had to stand in-front of a copy machine for hours to copy all the pages, HP Customer Care made the effort to ensure that John got what he needed and he was happy.

John went on to tell us how he uses his calculator and programs that he has created to help him with financial planning and pick which stocks to buy/sell. For John, HP Calculators are a universal tool he uses everyday of his life solving all kinds of problems. RPN is the data entry method he uses to easily express himself when solving complex problems with many variables. To John, RPN is simpler and was worth the investment to learn (although it only took a few problems to figure out). He gave us some very constructive feedback on how HP Calculators can continue to innovate into the future. We hear him loud and clear and HP Calculators are here to stay and to grow with his needs.

Lastly, we asked John what he hasn't done or accomplished in his life. His response was, "What can't an HP Calculator do? The sky is the limit."

To learn more about HP's Calculator Solutions, please visit us at www.hp.com/calculators. If you have a story to tell about your HP Calculators, please send us an email to new.calc@hp.com

## Matching Data and Graphs

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Click here for more information.

CES 2009 is over. Let's look back at some fun HP Calculator CES Trivia!

## Feature calculator of the month: 12c Platinum

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Tax time is here and HP Calculators can help! The 12c Platinum is at your service to make sure your taxes are done right!

The faster industry choice for real estate, banking and finance with RPN and algebraic entry.

Demanding financial professionals enjoy the HP 12c Platinum that is up to 6 times faster with 4 times the memory of the original HP 12c. Choose efficient RPN ${ }^{1}$ or algebraic entry-system logic. Take keystroke programming up to 399 steps and utilize over 130 built-in functions. "Undo" and "Backspace" buttons improve ease of use. Calculate TVM, loan payments, interest rates, standard deviation and more. Permitted for use on Certified Financial Planner ${ }^{\circledR}$ (CFP), Chartered Financial Analyst ${ }^{\circledR}$ (CFA), and Global Association of Risk Professionals $®$ Financial Risk Management ${ }^{\circledR}$ (GARP FRM ${ }^{\text {TM }}$ ) exam.

## Matching Data and Graphs

Often data sets are presented and we are asked to create a graphical representation of that data. Seldom are we given a graph and asked about an original data set. This activity will explore several data sets and graphs, specifically box and whisker plots and histograms.

Box and whisker plots are created from a five-number summary. Those five numbers are:

- lowest (or minimum)
- lower (or first) quartile
- median
- upper (or third) quartile
- highest (or maximum)

The lowest and highest values are easy to find once the data set has been ordered. The median is the value exactly in the middle of an ordered set of data. There are just as many data points above the median as there are below. The lower (or first) quartile is the median of the lower half of the data. The upper quartile is the median of the upper half of the data. The term quartile comes from the fact that when you take half of the lower half of data and then take half of the upper half, you have created four parts, or quarters, in the data.

The five-number summary is represented graphically with short vertical lines using a "box" and "whiskers". The box in the middle of the graph represents three values. The left side of the box is the lower quartile, the vertical line inside the box is the median, and the right side of the box is the upper quartile. From each side of this box are horizontal lines that are called the "whiskers". The short vertical line at the end of the left whisker is the lowest value and the short vertical line at the end of the right whisker is the highest value. A sample box and whisker plot is shown below.


Histograms group data into equal intervals. Once you have decided how you want to group your data (by 10's or 100's and so on), you tally how many data points fall into each interval. The $x-$ axis is marked off using the intervals you have chosen. The $y$-axis represents the frequency. A vertical bar is extended upward from an interval on the $x$ - axis to show the frequency for that interval. A sample histogram is shown below.


## Exercise 1

1. The following data represent enrollments at 20 middle schools in San Antonio.

| 688 | 512 | 1197 | 629 | 927 |
| :--- | :--- | :--- | :--- | :--- |
| 799 | 588 | 418 | 650 | 595 |
| 875 | 532 | 869 | 1192 | 854 |
| 685 | 822 | 746 | 572 | 863 |

Two box and whisker plots are shown below. The $x$ - axis goes from 0 to 1600 with a scale of 100. Which of these plots represents the data above? How do you know?


Plot \#1


Plot \#2
2. Enter the data into your 39gs, create the box and whisker plot, and verify your answer.

You enter data as you did in the previous activity. To produce a graph, you will need to go to the PLOT SETUP menu ( $2^{\text {nd }}$ PLOT). Choose the box and whisker plot as your graph and then enter the settings for the minimum and maximum $x$ and $y$ values and scale. (For a box and whisker plot, you will not need to worry about HWIDTH or HRNG.) You will need to go to the SYMB menu and check H1 in order to see the graph. Press PLOT and the box and whisker plot will appear on the screen.
3. Estimate how many students are in your school. Where is your estimate on the box and whisker plot? Explain your answer.

## Exercise 2

1. A box and whisker plot displaying the number of teachers at middle schools in a San Antonio districts is below. The $x$-axis for the graph is marked off in increments of 10 .


Data sets for three school districts are given below. Which district matches the above box and whisker plot? How do you know?

| District \#1 | District \#2 | District \#3 |
| :---: | :---: | :---: |
| 67 | 93 | 42 |
| 98 | 86 | 32 |
| 100 | 66 | 65 |
| 66 | 80 | 39 |
| 63 | 79 | 51 |
| 66 | 87 | 51 |
| 79 | 74 | 38 |
| 58 | 74 | 37 |
| 69 | 64 | 51 |
| 73 | 90 | 35 |
|  | 77 | 50 |
|  | 93 | 68 |
|  |  | 54 |
|  |  | 39 |
|  |  | 49 |

2. Confirm your choice by creating the box and whisker plot on your 39gs.
3. What are the characteristics of the other two data sets?
4. You may have noticed that the number of data points in each set was different. Explain why the number of data points is not an issue when comparing box and whisker plots.

## Exercise 3

A histogram for the number of calories for 10 popular items at a fast food restaurant is given below. In the graph, the $x$-axis is marked off in increments of 100 calories and the $y$-axis is marked off in increments of 1 item.


1. Describe what you see in this histogram.
2. Below is data for number of calories for the 10 popular items from three different fast food restaurants.

|  | Restaurant \#1 | Restaurant \#2 | Restaurant \#3 |
| :--- | :---: | :---: | :---: |
| Signature Burger | 670 | 620 | 540 |
| Regular <br> Hamburger | 290 | 310 | 250 |
| Regular <br> Cheeseburger | 330 | 355 | 300 |
| Chicken Sandwich | 660 | 510 | 360 |
| Chicken Nuggets | 210 | 580 | 250 |
| Medium Fries | 360 | 400 | 380 |
| Medium Coke | 200 | 300 | 210 |
| Chocolate Shake | 690 | 1070 | 770 |
| Fish Sandwich | 630 | 490 | 380 |
| Sausage Biscuit | 390 | 540 | 400 |

Which restaurant is shown in the histogram? How do you know?
You can use the 39gs to create a histogram by following steps similar to those of setting up a box and whisker plot. Once the data has been entered, you need to go to PLOT SETUP, choose histogram, and input the appropriate $x$ and $y$ settings. To graph a histogram, you will now need to worry about HWIDTH and HRNG. HWIDTH is set to be how wide you want the bar to be. HRNG is typically set the same as your XRNG.
3. When comparing box and whisker plots, the number of observations in a data set did not have to be the same. Explain why it is important when comparing histograms.

## Exercise 4

The gas mileage (given in miles per gallon) for 18 vehicles appears below.

| 20 | 15 | 40 | 41 | 28 | 36 | 34 | 16 | 31 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 35 | 33 | 38 | 27 | 34 | 19 | 29 | 17 | 18 |

There are two graphs shown below. In both graphs, the $x$-axis is marked in increments of 10 and the $y$-axis is marked in increments of 1 .

Which one matches the data set? How do you know? Use your 39gs to confirm your choice.


## Extension 1

Estimate the five-number summary for the second box and whisker plot in Exercise 1.

## Extension 2

Create histograms for the other two data sets in Exercise 3

## Teacher Notes

These activities ask students to compare different graphical and numerical representations of data; specifically, given one representation, students are asked to match it to one of several other representations.

## Teaching Standards

The table below lists the teaching standards found in this activity. These standards are general statements of what students should learn and practice doing in the course of the activity; that is, they are statements about both knowledge and skills. Each table starts with the general statement of each standard, followed by correlations to the California Content Standards for Mathematics and the Texas Essential Knowledge and Skills.

| Find and interpret measures of center and spread |  |  |
| :---: | :---: | :---: |
| CA | Grade 6: | 1.1: Compute the range, mean, median, and mode of data sets |
|  | Statistics, Data Analysis, and Probability | 1.4: Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context |
|  | Grade 7: Statistics, Data Analysis, and Probability | 1.3: Understand the meaning of, and be able to compute, the minimum, the lower quartile, the median, the upper quartile, and the maximum of a data set |
|  | Probability and Statistics | 6.0: Students know the definitions of the mean, median, and mode of a distribution of data and can compute each in particular situations |
| TX | Grade 6 Probability and Statistics | 6.10B: The student identifies mean (using concrete objects and pictorial models), median, mode, and range |
|  | Grade 7: <br> Probability and | 7.12A: The student is expected to describe a set of data using mean, median, mode, and range |
|  | Statistics | 7.12B: The student is expected to choose among mean, median, mode, or range to describe a set of data and justify the choice for a particular situation |
|  | Grade 8: Probability and Statistics | 8.12A: The student is expected to select the appropriate measure of central tendency or range to describe a set of data and justify the choice for a particular situation |


| Understand the correspondence between data sets and their graphical representations |  |  |  |
| :---: | :---: | :--- | :---: |
| CA | Grade 7: <br> Statistics, Data <br> Analysis, and <br> Probability | 1.1: Know various forms of display for data sets, including a stem-and-leaf plot or box- <br> and-whisker plot; use the forms to display a single set of data or to compare two sets of <br> data |  |
|  | Probability and <br> Statistics | 8.0: Students organize and describe distributions of data by using a number of different <br> methods, including frequency tables, histograms, standard line and bar graphs, stem- <br> and-leaf displays, scatterplots, and box-and-whisker plots |  |
| TX | Grade 6: <br> Probability and <br> Statistics | 6.10: Select and use an appropriate representation for presenting and displaying <br> different graphical representations of the same dara, including line plots, line graphs, bar <br> graphs, and stem and leaf plots, |  |
|  | Grade 7: <br> Probability and <br> Statistics | 7.11: The student understands that the way a set of data is displayed influences its <br> interpretation |  |
| Grade 8: <br> Probability and <br> Statistics | 8.12C: Select and use an appropriate representation for presenting and displaying <br> relationships among collected data, including line plots, , line graphs, stem and leaf plots, <br> circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with <br> and without the use of technology |  |  |

## Exercise 1

The first box and whisker plot is correct. The data shown in the exercise are from 17 SAISD schools and 3 South San ISD schools.
The data that create the second box and whisker plot also represent enrollments at 20 middle schools in San Antonio, but from other districts (Alamo Heights, East Central, Harlandale, and Judson).
The data are:

| 1015 | 1209 | 663 | 463 | 481 | 536 | 833 | 913 | 723 | 831 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 998 | 1503 | 952 | 854 | 998 | 843 | 975 | 916 | 810 | 948 |

For reference, the values used in each plot are below.
The five-number summary for Plot \#1 is: $\begin{array}{llllll}418 & 591.5 & 717 & 866 & 1197\end{array}$
The five-number summary for Plot \#2 is: $\begin{array}{lllllll}463 & 766.5 & 883.5 & 986.5 & 1503\end{array}$
The PLOT SETUP screens used to create the box and whisker plots are shown below.

|  |  |
| :---: | :---: |
| Sthtplat: Eigxin Hell | HWIDTH: 10 |
| XFAN: 6 | 16.6 |
| TFHG: -2 | 5 |
| HFRH: 6 | 109 |
| SELEST STATIStigs plat | PLIT TYPE |
| CHIDE Prite | GE |



## Exercise 2

To obtain the box and whisker plots for all three data sets, you can use the same PLOT SETUP screens.



To obtain each individual box and whisker plot, go into SYMB and indicate which data set you would like to plot.


The box and whisker plot in the exercise is for District \#2, which is Northside ISD. District \#1 is Northeast and District \#3 is San Antonio ISD. All three plots are shown below. The $\mathrm{x}-\mathrm{axis}$ is marked off in increments of 100 .

District \#1 (Northeast)


District \#2 (Northside)


District \#3 (San Antonio)


By checking all three data sets in the SYMB menu, you can see all three box and whisker plots on one screen. To prevent the last plot from touching the $x$-axis, you should make a slight modification to the PLOT SETUP menu as shown below.


## Exercise 3

Restaurant \#1 is Burger King. Restaurant \#2 is Whataburger. Restaurant \#3 is McDonalds, which matches the histogram. To see the histograms for all three restaurants, use the same PLOT SETUP screens shown below.



To see each histogram, check the appropriate data set in the SYMB menu.


## Restaurant \#1 (Burger King)



Restaurant \#2 (Whataburger)


Restaurant \#3 (McDonalds)


As shown in the PLOT SETUP menu, the $x$ - scale for each histogram is 10 and the $y$ - scale is 1 .

## Exercise 4

The make and model of the vehicles is given in the table below. The data are for 2007 model vehicles. The correct graph in the exercise is the box and whisker plot.

| Make and Model of Car | Highway Mileage |
| :--- | :---: |
| Toyota Corolla | 41 |
| Toyota Yaris | 40 |
| Honda Civic | 38 |
| Hyundai Elantra | 36 |
| Hyundai Accent | 35 |
| Nissan Altima | 34 |
| Nissan Versa | 34 |
| Toyota Camry | 33 |
| Toyota Avalon | 31 |
| Chevrolet Impala | 29 |
| Pontiac G6 | 28 |
| Ford Taurus | 27 |
| Dodge Charger | 20 |
| Chevrolet Suburban | 19 |
| Lincoln Navigator | 18 |
| Toyota Land Cruiser | 17 |
| Mercedes Benz G500 | 16 |
| Jeep Grand Cherokee | 15 |

The data used for the histogram comes from grades of 18 students on a 50 point project in a statistics class. That data set is below.

| 18 | 18 | 20 | 22 | 23 | 25 | 30 | 34 | 35 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 38 | 40 | 42 | 42 | 43 | 45 | 46 | 48 | 49 |

## Answer Key

## Exercise 1

1. Plot \#1 is correct. Students should be able to justify their answers by looking at the minimum and maximum values in the given data set and matching it to the correct box and whisker plot.
2. To create the box and whisker plot on the calculator, use the SETUP screens below. The correct plot is also shown again below.

| §ED**s Statistics PLat | PLDT SETUP: |
| :---: | :---: |
|  | HWILTH: 10 |
| HFNG: 区 1 | 1600 |
| YFNG: -2 5 | 5 |
| HFNG: 区 1 | 1610 |
| SELECT Statistics plat | PLIT TYPE |
| CHID P Phte | GE |



3. If students do not have a feel for how many students are in your school, they can still make a guess. The emphasis should be placed on locating values on the box and whisker plot rather than their estimation of the number of students.

## Exercise 2

1. The box and whisker plot is for District \#2. Students should be able to confirm their choice by using the calculator to create the plots, by using five-number summaries for the data, or simply relying on the highest and lowest values from the data sets.

The five-number summaries for each district are given below.

| District \#1: | 58 | 66 | 68 | 79 | 100 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| District \#2: | 64 | 74 | 79.5 | 88.5 | 93 |
| District \#3: | 32 | 38 | 49 | 51 | 68 |

2. The SETUP screens for creating the box and whisker plot are shown below. The correct graphs for all districts were previously shown in the Teacher Notes.

|  |  |
| :---: | :---: |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |


3. For District \#1, the lowest value is between 50 and 60 and the highest value is at 100 . For District \#3, the lowest value is between 30 and 40 and the highest value is between 50 and 60. You may also want students to describe the data sets using the five-number summaries, which were given in the answer to \#1 above.
4. The number of data points is not an issue to compare box and whisker plots. We are only comparing low, middle and high values, not the actual number of data points. We will do this with histograms in the next exercise.

## Exercise 3

1. Students should see in the histogram that there are 3 observations in the 200 bar, 4 observations in the 300 bar, and one observation each in the 400 bar, 500 bar, and 600 bar.
2. The restaurant that matches the histogram is Restaurant \#3, which is McDonalds. Students can verify their answer by counting tallies of all three data sets to see what matches and by creating histograms on the calculator.
3. To choose between two histograms for one data set, the two histograms should have the same number of data points represented. Otherwise, if one data set has more points, its histogram will have taller bars (to represent a higher frequency) and you can easily tell which histogram is correct by simply counting data points but not really understanding the graph.

## Exercise 4

Students should notice that the data set has 5 observations that would fall in the 10 bar of a histogram, 4 observations in the 20 bar, 7 observations in the 30 bar , and 2 observations in the 40 bar. These numbers do not match the histogram shown. On the other hand, the five-number summary of the data is:

$$
\begin{array}{lllll}
15 & 19 & 30 & 35 & 41
\end{array}
$$

which corresponds to the box and whisker plot shown. Students should also create both graphs for the data set on the calculator. The box and whisker plot and histogram for the given data set are shown below.


## Extension 1

The five number summary for Plot \#2 is: $\quad 463 \quad \begin{array}{llllll}766.5 & 883.5 & 986.5 & 1503\end{array}$
These are the exact values and students will not be able to find them easily. However, they should be able to make reasonable estimates by reading the box and whisker plot.

## Extension 2

The two histograms for Restaurant \#1 and Restaurant \#2 are shown again below.
Restaurant \#1 (Burger King)


Restaurant \#2 (Whataburger)


## HP CES Calculator Trivia

Richard J. Nelson, Jake Schwartz, \& Wlodek Mier-Jedrejowicz
With the start of a new year HP introduced three new calculators at the Consumer Electronics Show, CES. These new models are added to the 92 machines "announced" during the previous 37 years.

- The average number of machines announced in 37 years (92/37) is 2.5 machines each year.
- HP did not announce a new machine every year. No machines were announced during seven of the 37 years - 1985, 1992, 1994, 1996, 1997, 2002, and 2005.
- The greatest number of new machine announcements was eight new models in 1988.
- The years with the second highest number of new machine announcements (seven) are 1977, 2003, and 2008.
- The number of new machines announced this century (2000 through 2008) is 27. The number of new models announced the decade before (1990 through 1999) is 13. The table at the right tallies the number of machines announced during the nearly four decades HP has been making calculators.

| Decade | No. | \% |
| :--- | :---: | :---: |
| 1970's | 29 | 31.5 |
| 1980's | 24 | 26.1 |
| 1990's | 12 | 13.0 |
| 2000's | 27 | 29.4 |

- The most popular month for HP to announce a new machine is January. Over one fifth, $21 \%$ of their 92 calculators, was announced in January.
- June and July are the next two popular months to announce a new machine, 12 in each month. Twenty six percent of their machines were announced during these two summer months.
- The least popular month for HP to announce a new calculator is November. Only one machine, the hp40gs, was announced in November (November 8, 2006) - in 37 years of calculator announcements.
- The exact date of announcement is not always historically clear or easily known. Of the 92 calculators, only one, the HP10s is still uncertain.
- The most popular date to announce a new machine is the first of the month. Nearly half, $44.6 \%$, of HP's new calculators are announced on the first of the month.
- The second largest number of machines announced on a specific date is six on the $8^{\text {th }}$ of the month.
- Three machines per day would be the average if all of HP's 92 machines were introduced in one month (92/31).
- In 37 years seven dates have never had an HP machine announced $-9^{\text {th }}, 11^{\text {th }}$, $17^{\text {th }}, 18^{\text {th }}, 25^{\text {th }}, 26^{\text {th }}, \& 29^{\text {th }}$.
- The most HP popular model number is 10 . See Model 10 's in the table at the right.

| Model 10 |  |
| :--- | :--- |
| HP10 Quick Calc |  |
| HP10A | HP10bII |
| HP10B | HP10C |
| HP10BII | HP10s |

- The longest model number is the HP12c Prestige (5/27/2003) at 14 characters. A classical HP model number is five characters. HP (2), No. (2) Suffix letter (1). A new "naming system" is currently being used, e.g. HP OfficeCalc 300, HP EasyCalc 100, HP SmartCalc 300s.

