The Ordinary Man

Overview – Activity ID: 8935

Students will estimate the heights of various celebrities in feet and inches. They will use the TI-34 MultiView scientific calculator to convert actual heights in inches to feet and inches, and they will compare the actual heights with their estimated heights. Finally, they will graph the estimated heights and actual heights of the celebrities.

Math Concepts

- Multiple representation of numbers
- Estimation
- Fractions and mixed numbers
- Quotients and remainders
- Measurement
- Conversions
- Graphing

Materials

- TI-34 MultiView™

Activity

Begin with a discussion about estimation.

Often, it is necessary for us to estimate. In the store, for instance, it makes more sense to estimate how much we've spent than to keep a running total using an exact calculation. Let's see how estimation and calculation work together.

Show students how estimation is a good starting point and how checking those answers later, using a calculator, helps them verify their estimations.

If you were shopping and needed to know how much money you had left to spend, it would be important to be able to do a quick estimation. For example, if you had $20 and a cart half full of snacks, you could run through the prices, rounding to the nearest dollar or half-dollar, to come up with a good estimate of what you'd spent.

Now, give an actual example so students can practice this concept.

If you have a large bag of pretzels, two six-packs of soda, and a one-pound bag of candy, how much would you have left to spend?

The students' estimations will vary, depending on what they believe the prices of the items to be. Ask each to do his or her own mental calculation. Discuss results briefly, including a discussion on whether students used fractions, decimals, or whole numbers.

Move on to estimating heights, and discuss using fractions, decimals, or whole numbers.

Think of a professional basketball player. More likely than not, would that person be tall or short? What would be a height for the stereotypical basketball player?

Note how the students answer. Point out that they have used feet (e.g., 7 ft), or sometimes feet and inches (e.g., 6 ft 8 in.), or a mixed number (e.g., 6 ½ ft). Likely, no student described height in inches or with a decimal. Discuss that.

If someone is 89 inches tall, how tall is that in feet? Mentally estimate or guess. How would we convert? How many inches are there in one foot?

The Ordinary Man

Discuss how to convert from inches to inches and feet using the fact that 12 in. = 1 ft. Show the above example on the board, ending up with the decimal 7.416666666.

First, how close was your estimate? Why did you estimate the number you did? Now, we normally don't say someone is about 7.42 feet tall. What does that mean? By converting this decimal approximation, we can learn this person's exact height.

Show how the calculator can be used to convert decimals to fractions.

There are many features on the TI-34 MultiView scientific calculator that make it easy to convert between decimals and fractions or mixed numbers. Use your calculator to see how tall the person is. Since there are 12 inches in a foot, we can see that 5/12 of an inch represents 5 inches. This person is 7 feet 5 inches tall.

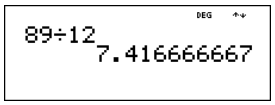
Introduce the Integer Divide feature of the TI-34.

The TI-34 MultiView has an additional feature called Integer Divide. This feature allows users to divide any two positive integers and see the quotient and remainder, rather than the decimal approximation. Let's try it.

Note that the calculator's answer is given as 7r5, which equates to 7 feet 5 inches.

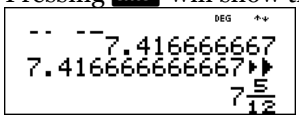
Follow these steps:

1. Press [8] [9] [÷] [1] [2] [enter].
2. Screen should show this:



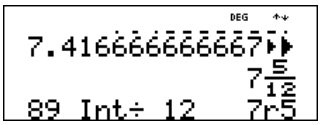
Follow these steps:

1. Press [2nd] [▫◂▸▫].
2. Pressing [enter] will show this:



Follow these steps:

1. Press [8] [9] [2nd] [int÷] [1] [2] [enter].
2. Screen should show this:



The Ordinary Man

Name _____

Date _____

1. Estimate the height of each celebrity or public figure. If you are not sure who the people are or how tall they are, use the Internet to find pictures of them standing next to others, standing by a door, etc., so you have a reference point. Use feet and inches (example: 6 ft 2 in.). Rewrite the celebrities in order from shortest to tallest, based upon your estimations.

Name	Estimated height
Shania Twain	
Sylvester Stallone	
Prince William	
Sammy Sosa	
Queen Elizabeth	
Brad Pitt	
Oprah Winfrey	
Madonna	
Tiger Woods	
Shaquille O'Neal	
Hillary Clinton	
Fergie (Black Eyed Peas)	
Nick Lachey	
Rudy Giuliani	

Shortest to tallest

The Ordinary Man

Name _____

Date _____

2. Now, given the actual heights of the celebrities in inches, use the Integer Divide feature of your calculator to determine their heights in feet and inches. Problems with  beside them should be done mentally. Transfer your estimated heights from the table on page 1, then find your measure of error by subtracting.

Name	Estimated height	Actual height in inches	Actual height in feet and inches	Measure of error in inches (actual height – estimated height)
Shania Twain		64		
Sylvester Stallone		67		
Prince William		74		
Sammy Sosa		72		
Queen Elizabeth		65		
Brad Pitt		73		
Oprah Winfrey		67		
Madonna		66		
Tiger Woods		74		
Shaquille O'Neal		85		
Hillary Clinton		66		
Fergie (Black Eyed Peas)		62		
Nick Lachey		70		
Rudy Giuliani		63		

3. Construct a scatter plot to the right. Plot your estimates on the *y*-axis and the actual heights on the *x*-axis. Label your axes and the scale you use.

4. What would the scatter plot to the right have looked like if you had estimated every person's height correctly? Use a different color/mark to indicate those points. Describe how your initial set of points compares to the second set.

The Ordinary Man

Answer Key

1. Answers will vary.

2. Now, given the actual heights of the celebrities in inches, use the Integer Divide feature of your calculator to determine their heights in feet and inches. Transfer your estimated heights from the table on page 1, then find your measure of error by subtracting.

Name	Estimated height	Actual height in inches	Actual height in feet and inches	Measure of error in inches (actual height – estimated height)
Shania Twain	varied	64	5 ft 4 in.	varied
Sylvester Stallone	varied	67	5 ft 7 in.	varied
Prince William	varied	74	6 ft 2 in.	varied
Sammy Sosa	varied	72	6 ft	varied
Queen Elizabeth	varied	65	5 ft 5 in.	varied
Brad Pitt	varied	73	6 ft 1 in.	varied
Oprah Winfrey	varied	67	5 ft 7 in.	varied
Madonna	varied	66	5 ft 6 in.	varied
Tiger Woods	varied	74	6 ft 2 in.	varied
Shaquille O'Neal	varied	85	7 ft 1 in.	varied
Hillary Clinton	varied	66	5 ft 6 in.	varied
Fergie (Black Eyed Peas)	varied	62	5 ft 2 in.	varied
Nick Lachey	varied	70	5 ft 10 in.	varied
Rudy Giuliani	varied	63	5 ft 3 in.	varied

3. Construct a scatter plot to the right. Plot your estimates on the *y*-axis, and the actual heights on the *x*-axis. Label your axes and the scale you use.

   Graphs will vary, depending upon students' estimates of the people's heights. The scales will also vary between inches (65 in.) and feet and inches (5 ft 5 in.).

4. What would the scatter plot to the right have looked like if you had estimated every person's height correctly? Use a different color/mark to indicate those points. Describe how your initial set of points compares to the second set.

   If every estimate had been correct, the points would have fallen along the line $y = x$. Students may not state the equation of the line; they may indicate "a line that goes up at a 45° angle" or something similar.