

# Math TODAY™

## Teacher Edition



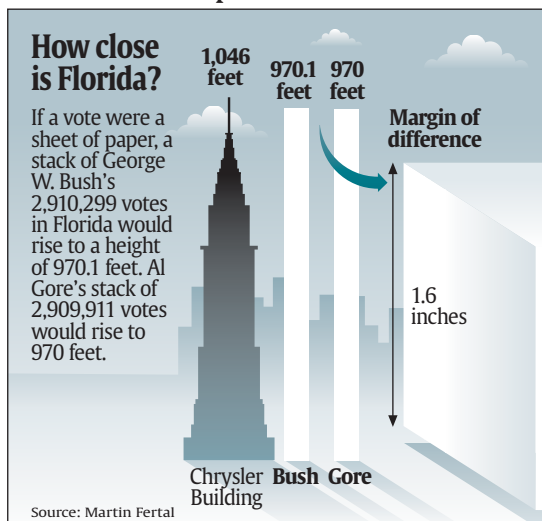
NO. 1 IN THE USA



## How close is Florida?

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### USA TODAY Snapshots®



### Activity Overview:

In this activity, students are going to recreate and verify the information in the USA TODAY Snapshot "How close is Florida?" Students will determine the number of sheets of paper in a one-inch stack. Using this information, they will determine the thickness of one vote (sheet of paper) and conclude how close their calculations are to the graphic designer.

### Concepts:

- Unit conversion
- Interpolation and extrapolation of data
- Number sense
- Measurement

### Objectives:

Students will:

- measure accurately.
- convert units of measurement.
- calculate accurately using extremely large numbers.
- use their own data information to make estimates.
- evaluate the accuracy of a graphic using their own estimates.

### Activity at a Glance:

- Grade level: 6-8
- Subject: Pre-Algebra
- Estimated time required: 30-40 minutes

### Materials:

- TI-83 Plus family or TI-84 Plus family
- Several reams of paper
- Rulers
- Overhead view screen calculator for instruction/demonstration
- Student handout
- Transparency
- USA TODAY newspapers

### Prerequisites:

Students should know how to:

- convert from one unit to another.
- find percent of change.
- recognize scientific notation on the calculator.



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## How close is Florida?

### Background:

The 2000 presidential election was closer than most in recent history. It raised questions about voting procedures, voting accuracy and our current electoral system. But how close was it? The USA TODAY Snapshot "How close is Florida?" gives a visual representation of the difference in the votes between the 2000 presidential candidates Al Gore and George W. Bush and demonstrates how insignificant the difference was compared to the number of votes cast.

The education system helps produce educated citizens who are able to make intelligent decisions about government issues, especially in the selection of various officials. Activities such as this help emphasize the importance of each vote and demonstrate how each individual's involvement can affect the outcome.

### Preparation:

- Provide one graphing calculator for each student.
- Each student should have a copy of the corresponding student activity sheet.
- Obtain several reams of paper (one ream for each group should be sufficient).

### Classroom Management Tips:

- Students will have a better understanding of how to read the graphic and retrieve data if you use the transparency for a class discussion before the students start working.
- Allow students to talk about the "how" and "why" approach they used to find the solutions.
- Students will need to work in groups of 3 - 5 on this activity. Working in groups is especially helpful as they learn the various features of the calculators and it helps insure accuracy when it comes to measuring.
- If you want uniform answers from the entire class you may want the students to use one measurement from each group to complete the chart. Then, use a class average for the number of sheets in a one-inch stack.
- Discuss measuring techniques to insure accuracy.
- Use a ½ inch stack to minimize the counting time.
- Encourage students to make estimates of answers to eliminate grossly incorrect solutions. Have them write these estimates in the margin of their

### Data Source:

Martin Peral

### National Council of Teachers of Mathematics (NCTM) Standards\*:

#### Number and Operations

- Compute fluently and make reasonable estimates.

#### Measurement

- Understand measurable attributes of objects and the units, systems, and processes of measurement.
- Apply appropriate techniques, tools, and formulas to determine measurements.

#### Data Analysis and Probability

- Develop and evaluate inferences and predictions that are based on data.

#### Problem Solving

- Solve problems that arise in mathematics and in other context.

#### Reasoning and Proof

- Make and investigate mathematical conjectures.

#### Communications

- Organize and consolidate their mathematical thinking through communications.
- Communicate their mathematical thinking coherently and clearly to peers, teacher and others.
- Analyze and evaluate the mathematical thinking and strategies of others.

\*Standards are listed with the permission of the National Council of Teachers of mathematics (NCTM), [www.nctm.org](http://www.nctm.org). NCTM does not endorse the content or validity of these alignments.

## How close is Florida?

### Activity Extension:

- Give different groups different weights of paper. Have each group present to the class and discuss the differences.
- Present the class with the following question to answer relative to the last question on the Assessment and Evaluation section. "What does your answer tell you about the 2000 election?"
- Have students research a recent local election and create a similar graphic. They would need to calculate the height of votes per candidate, research and find a land site of approximately the same height to create their own graphic.
- Have students find the weight of a one-inch stack of paper and estimate the total weight of the votes in the USA TODAY Snapshot.

### Curriculum Connections:

- Social Studies
- Government
- U.S. History

### Additional Resources:

- Student handout
- Transparency
- TI Technology Guide, for information on the following: TI-83 Plus family, TI-84 Plus family and List Editor
- TI-Navigator™ Basic Skills Guide for information on using the TI-Navigator Classroom Learning System

### Teacher Notes:

## How close is Florida?

### Assessment and Evaluation:

**Q. What was your group's average number of sheets of paper per inch? What is the thickness of one sheet of paper?**

A. Number of sheets of paper per inch = 250 Thickness of one sheet = 0.004

Note: Student answers will vary, but reasonable answers are presented as a guideline.

**Q. How high would your vote stacks be?**

A. Bush: 11,641 inches = 970.1 feet

Gore: 11,640 inches = 970.0 feet

**Q. How many sheets per inch did the graphic designer use? What is the thickness of one vote? Show your work in terms of a mathematical expression!**

A. Number of votes of paper per inch: 250      Thickness of one sheet: 0.004 inch  
 Number of votes / (Height in feet x 12)      (Height in feet x 12) / Number of votes

**Q. What was the difference in your calculations and that of the graphic designer's? Was the difference significant? What could account for the difference?**

A. Student answers will vary.

**Q. What was the percent of difference of total votes between the number of votes received by each candidate? Show your work; convert your final answer to a percent, and round your answer to the first non-zero digit.**

A. Method 1: (Number of votes for Bush - Number of votes for Gore) ÷ Total number of votes cast for the 2 candidates  
 $388 \div 5,280,210 = 0.000066 = 0.007\%$

Method 2: Difference in the height of the stacks ÷ the combined height of the two stacks  
 $(1.6 \text{ in} / 12 \text{ in}) \text{ feet} / 1940.1 \text{ feet} = 0.000068 = 0.007\%$



If you are using the TI-Navigator Classroom Learning System, send the provided LearningCheck assessment to your class to gauge student understanding of the concepts presented in the activity. See the TI-Navigator Basic Skills Guide for additional information on how this classroom learning system may be integrated into the activity.