Making Everything Easier!™

2nd Edition

TI-Nspire™

FOR DUMMIES®

Learn to:

- Use all features of the new touchpad
- View graphical, algebraic, numeric, geometric, and written formats
- See and make connections among multiple representations at once
- Explore the new TI-Nspire CX full-color display

Jeff McCalla
Steve Ouellette

Get More and Do More at Dummies.com®

Start with **FREE** Cheat Sheets

Cheat Sheets include

- Checklists
- Charts
- Common Instructions
- And Other Good Stuff!

To access the Cheat Sheet created specifically for this book, go to
www.dummies.com/cheatsheet/tinspire

Get Smart at Dummies.com

Dummies.com makes your life easier with 1,000s of answers on everything from removing wallpaper to using the latest version of Windows.

Check out our

- Videos
- Illustrated Articles
- Step-by-Step Instructions

Plus, each month you can win valuable prizes by entering our Dummies.com sweepstakes. *

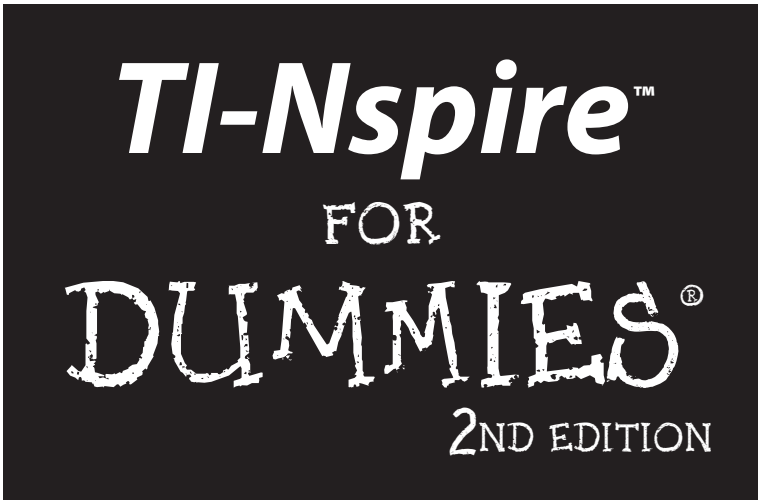
Want a weekly dose of Dummies? Sign up for Newsletters on

- Digital Photography
- Microsoft Windows & Office
- Personal Finance & Investing
- Health & Wellness
- Computing, iPods & Cell Phones
- eBay
- Internet
- Food, Home & Garden

Find out "HOW" at Dummies.com

**Sweepstakes not currently available in all countries; visit Dummies.com for official rules.*

TI-Nspire™ FOR DUMMIES® 2ND EDITION



by Jeff McCalla and Steve Ouellette

WILEY
Wiley Publishing, Inc.

TI-Nspire™ For Dummies®, 2nd Edition
Published by
Wiley Publishing, Inc.
111 River Street
Hoboken, NJ 07030-5774
www.wiley.com

Published by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

Library of Congress Control Number: 2011928436

ISBN: 978-1-118-00466-1

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1

About the Authors

Jeff McCalla is currently teaching mathematics at St. Mary's Episcopal School in Memphis, Tennessee, where he also coaches the golf team. Jeff holds a bachelor's degree in Christian education with a minor in mathematics from Wheaton College and a Master of Arts in Teaching degree from the University of Memphis. Jeff is the cofounder of the TI-Nspire SuperUser group, dedicated to providing advanced training from the world's foremost experts. In addition, he enjoys traveling the country training teachers as a T^3 Regional Instructor for Texas Instruments. Jeff has had the privilege of being a part of numerous TI-related projects including writing TI-Nspire documents that align with the 2011 edition Pearson textbooks. A highlight for Jeff was receiving the Presidential Award for Excellence in Science & Mathematics Teaching and with it the opportunity to meet President Obama and Secretary of Education, Arne Duncan. When he is not meeting important dignitaries, Jeff enjoys going to ballgames with his boys, playing golf and racquetball, reading Malcolm Gladwell and John Wooden, getting free stuff, teaching Sunday school, and making his wife smile.

Steve Ouellette, or Mr. O, is currently the Math Department chair at Westwood High School in Westwood, Massachusetts. Steve holds a bachelor's degree in electrical engineering from Worcester Polytechnic Institute and a Master of Arts in teaching degree from Boston University. Steve began his teaching career in 1993 after having worked as an electrical engineer at Otis Elevator Company for five years. His engineering expertise helped fuel Steve's passion for incorporating educational technology into his teaching. In addition to this book, Steve has also authored the *CliffsNotes Guide to TI-Navigator* and the *CliffsNotes Guide to TI-Nspire,* and he relishes the irony that he used to avoid writing assignments during his high school and college years. Steve has enjoyed working on a number of other TI-related projects, most notably as a regular activity writer for the *We All Use Math Everyday* program, a Texas Instruments and NCTM joint venture that provides classroom activities that relate mathematics to the TV series *NUMB3RS.* When he's not lobbying for a cameo role on *NUMB3RS,* Steve enjoys spending time with his family, camping, running with his weekend warrior buddies, and watching the local sports teams compete for championships. His passion for baseball is evident in the name chosen for his 90-pound labradoodle, Wally, named after the mascot for the Boston Red Sox.

Dedication

Jeff McCalla: This book is dedicated to my family: my wife, Shannon, and my three boys Matt, Josh, and Caleb.

Steve Ouellette: This book is dedicated to my family: my wife Christine and my three boys, Noah, Ben, and Danny.

Authors' Acknowledgments

Jeff McCalla: I could not have written this book without the help and support of the people at John Wiley & Sons. I want to thank my project editor, Christopher Morris, whose commitment to excellence was instrumental. I also want to thank my acquisitions editor, Amy Fandrei, for showing me the ropes and keeping me to a tight schedule. In addition, I want to thank Douglas Shaw whose sharp eyes and math expertise contributed to the accuracy of the book.

I certainly want to thank my friends at Texas Instruments for their ongoing support. The leadership of Gayle Mujica, Maggie Sherrod, Charlyne Young, and Ellen Johnston has helped make this project possible. In particular, Lydia Neher has come through for me every time I needed an updated device or software build. Of course, Tonya Hancock's support role in forming the TI-Nspire SuperUser group helped fuel my TI-Nspire addiction.

Fellow T^3 instructors have assisted me with their help when called upon. Jennifer Wilson's eye for detail continues to amaze me; her assistance was invaluable. I want to thank Jill Gough, who introduced me to TI-Nspire and changed my approach to teaching. Bryson Perry, Nelson Sousa, and Sean Bird's technical expertise has been a valuable resource.

On the home front, I wish to thank my teaching colleagues, Orion Miller, Sandra Halfacre, and Chrystal Hogan, who were a nice resource when I had questions. In addition to my immediate family, I want to thank my parents, Bud and Elaine McCalla, whose passion for mathematics rubbed off on me. Finally, I want to thank my students, who are the inspiration for much of what I do.

Steve Ouellette: I'd like to thank the good people at John Wiley & Sons who have provided so much support throughout the writing process. First and foremost, I thank my developmental editor, Christopher Morris, for all his support and expertise. I'm absolutely blown away by his knowledge of the *For Dummies* way. I also want to thank my acquisition editors, Amy Fandrei and Tiffany Ma, for helping me adhere to a tight schedule and for all their help related to the content and outline of this book. Additionally, I thank Douglas Shaw, associate professor of mathematics at the University of Northern Iowa, for verifying the mathematical and technical accuracy of this book. There are so many other people that come into play after the acknowledgments are written, so for all the support I know I'll be getting, many, many thanks. Although she hasn't worked directly with me on this project, I must thank

Zöe Wykes for all her help with the *CliffsNotes* books. There's no doubt that my work with Zöe helped make the transition to *TI-Nspire For Dummies* a smooth one.

I certainly wish to thank my friends at Texas Instruments for their ongoing support. In particular, I thank the past and present "big three" of the Content Team — Maggie Sherrod, Steven Bailey, and Vince O'Connell. Maggie, your support and unique sense of humor are so much appreciated. Steven, while your role has since changed, I thank you for being my first "boss" and for your ongoing support. And Vince, you have continued to lend a hand on so many fronts. Every time I need something, whether it's an updated device, a piece of software, or a set of Learning Objects, you've been there to help out. There are many other folks whom I've come in contact with over the years as a result of my affiliation with Texas Instruments. Although I appreciate the professional growth these relationships have offered, it's the personal friendships that I've formed that have made this experience so wonderful.

On the home front, I wish to thank my teaching colleagues and friends for all your interest in and support for this endeavor. In addition to my immediate family, I want to personally thank my mom and dad, Vivianne and Henry Ouellette; my brother Paul Ouellette; his wife, Kate; and their children, Alyssa and Christopher, for simply lending an ear. This means the world to me.

Publisher's Acknowledgments

We're proud of this book; please send us your comments at http://dummies.custhelp.com. For other comments, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

Some of the people who helped bring this book to market include the following:

Acquisitions and Editorial

Sr. Project Editor: Christopher Morris

Acquisitions Editor: Amy Fandrei

Copy Editors: John Edwards, Jennifer Riggs

Technical Editor: Dr. Douglas Shaw, University of Northern Iowa

Editorial Manager: Kevin Kirschner

Editorial Assistant: Amanda Graham

Sr. Editorial Assistant: Cherie Case

Cartoons: Rich Tennant (www.the5thwave.com)

Composition Services

Project Coordinator: Patrick Redmond

Layout and Graphics: Timothy C. Detrick, Andrea Hornberger, Heather Pope, Corrie Socolovitch

Proofreader: Laura Bowman

Indexer: Sharon Shock

Publishing and Editorial for Technology Dummies

Richard Swadley, Vice President and Executive Group Publisher

Andy Cummings, Vice President and Publisher

Mary Bednarek, Executive Acquisitions Director

Mary C. Corder, Editorial Director

Publishing for Consumer Dummies

Diane Graves Steele, Vice President and Publisher

Composition Services

Debbie Stailey, Director of Composition Services

Contents at a Glance

Table of Contents

Introduction

TI-Nspire changes the way that teachers teach and students learn. This transformative device has just undergone a transformation of its own. The TI-Nspire CX features color on the handheld (which is definitely a game-changer). The Touchpad control of TI-Nspire is another innovation that helps students to interact with the mathematics. In addition, the operating system has undergone some major improvements in the last few years. These are some of the reasons we have updated this book.

Many of the improvements to TI-Nspire (both the OS and hardware) and TI-Nspire Computer Software are a direct result of feedback received from teachers and students. Texas Instruments is committed to providing the best tools for the teaching and learning of mathematics and science.

Do you know how to use TI-Nspire to do each of the following?

- Create and edit documents that contain multiple pages and problems
- Evaluate expressions in the Calculator application and work with fractional or decimal results
- Graph and manipulate a parabola
- Manipulate a geometric object and analyze its changing attributes on a coordinate plane in real time
- Generate a sequence in the Lists & Spreadsheet application
- Enter data in the Lists & Spreadsheet application and construct a summary plot in Data & Statistics that compares the data in a side-by-side bar chart
- Use TI-Nspire Computer Software to insert a color background image on a Graphs page
- Take pictures of your TI-Nspire Handheld screen and insert them in a word processing document
- Link TI-Nspire applications to represent information algebraically, numerically, graphically, and verbally

If not, then this book is for you. As you read through the pages, you will find straightforward and practical information that is sure to take you well beyond the beginning stages of using TI-Nspire.

About This Book

This book will not tell you everything you need to know about TI-Nspire. However, I do cover all the basics and give you the tools to start creating your own TI-Nspire documents. Additionally, you will see enough examples to gain an appreciation for the *potential* that TI-Nspire has to offer. It's my belief that your experience gained from reading this book (and playing along on your TI-Nspire device) will give you the confidence to forge out on your own.

I outline a lot of concrete steps and processes to perform a variety of tasks. I use specific math applications as the backdrop for these tasks for the purpose of demonstrating how TI-Nspire can be used as a wonderful teaching and learning tool. As you read this book, you will begin to appreciate that TI-Nspire is a very robust device — if you can think it, TI-Nspire can most likely represent it.

TI-Nspire Terminology

TI-Nspire learning technology comes with its own unique language. The meaning of most TI-Nspire-related words found in this book can be initially understood from their context. However, just to avoid any unnecessary confusion, here are three key terms that you should know right from the get-go:

- **Handheld:** I use this term when referring to the TI-Nspire product that you quite literally hold in your hand. You find three families of TI-Nspire Handhelds: TI-Nspire with Clickpad (the original), TI-Nspire with Touchpad (the next generation), and TI-Nspire CX (new color version), as well as CAS versions of each type (with the computer algebra system built-in). Notice that it is not called TI-Nspire Calculator, but TI-Nspire Handheld, because it is much more than just a calculator! Incidentally, the word "handheld" will be capitalized when prefaced by TI-Nspire, otherwise it will be lowercase.
- **Tool:** I routinely make reference to *tools* when talking about some of the features contained in the Graphs or Geometry application. When a tool is activated in either application, its associated icon is displayed in the upper-left corner of the screen. A tool remains active until you press either esc or tab, or when you begin using another tool. The Triangle tool is one such example. As the name implies, this tool allows you to draw a triangle.

- **TI-Nspire Computer Software:** Texas Instruments offers two types of software: TI-Nspire Student Software (which comes free with the purchase of a handheld) and TI-Nspire Teacher Software. Because these products are so similar, I often use the more generic term to describe both. Schools and our society are using computers more and more. With that in mind, one chapter on TI-Nspire Computer Software has been expanded to include three chapters in the update of this book.

Conventions Used in This Book

When I wrote this book, I had to train myself not to refer to the TI-Nspire unit as a *calculator.* This word is quite misleading, and it suggests that TI-Nspire has a limited amount of computing power. Rather, you will find that I refer to this product as a *device* or *handheld.*

As for pressing keys, I always refer to them by an icon represented by the physical key. For example, rather than saying "press the Enter key," I say "press enter." Sometimes, I refer to a sequence of keys to push, in which case I say "press ctrl to grab the object."

To access secondary functions, you must first press the ctrl key. I always tell you the exact keys to press to access such functions. For example, I say "press ctrl x^2 to access the square root template."

The Touchpad (similar to a touchpad on a laptop) is located at the top of the keypad with the key in the center. You also see small ◀ ▶ ▲ ▼ symbols located on the Touchpad. If I want you to move the cursor in a specific direction, say to the left, I tell you to "press the ◀ key repeatedly." If I simply want you to move the cursor to some other location, I say, "Use the Touchpad keys to move the cursor to a new location." If you want to move quickly, just swipe your finger across the Touchpad like you would on a laptop.

Foolish Assumptions

I assume that you are a beginning user who wants to discover the basics to get up and running with TI-Nspire. Why else would you choose to read a *For Dummies* book? Here are some other assumptions that I've made:

- You already own a handheld device or are planning on obtaining one soon.
- You are either an educator or a student. Being an educator myself, I found it tempting to write this book from a teacher's perspective. Although I do make some occasional references to teachers, you can expect that this book will work equally well for both teachers and students.

- As you see in Part IX, TI-Nspire Computer Software works nicely as a companion to the handheld device. I wrote these chapters under the assumption that you have some basic knowledge of how computers work. As you see in other sections of this book, a basic working knowledge of computers also comes in handy when working with your TI-Nspire Handheld (the *right-click* shortcut will become your best friend).

How This Book Is Organized

This book is organized around TI-Nspire's seven core applications. Because TI-Nspire applications often work together, it's hard to talk about them in isolation. However, I've done my best to write this book in such a way that you can jump in pretty much anywhere in the text without having to read the pages leading up to it. That being said, I recommend that you read this book sequentially to get the most out of it.

Part I: Getting to Know Your TI-Nspire Handheld

In this part, I cover all the basics. This is where I introduce you to the philosophy behind TI-Nspire, the initial setup procedure, the document model, and all the tips and tricks that allow you to create, edit, and navigate documents quickly and efficiently.

If you are the type who likes to jump around from section to section, go right ahead. However, check out this part of the book first. It gives you the underlying structure to everything TI-Nspire.

Part II: The Calculator Application

This part gets into the first of seven core TI-Nspire applications. Here, you find out how to access a range of tools and commands that allow you to work with a variety of mathematical expressions and equations. In this part, I also start getting into how the Calculator application can "talk" to other applications. Finally, I introduce you to the computer algebra system of the TI-Nspire CAS Handheld.

Part III: The Graphs Application

The Graphs application represents one of TI-Nspire's most powerful applications. You find out how this application is used to provide a wide variety of different graph types, including functions, inequalities, scatter plots, polar equations, parametric equations, differential equations, and sequences.

I hope you'll also recognize the advantages that the Graphs application has to offer, providing a visual representation that can be analyzed right in the graphing window.

Part IV: The Geometry Application

The Geometry application provides one of TI-Nspire's most dynamic environments. Here, you find out how to work in an analytical environment, a plane geometry environment, or a combined analytic/plane geometry environment.

If you have some experience working with dynamic geometry software, you'll appreciate the smooth transition to this application. I hope you'll also recognize the advantages that the Geometry application has to offer, especially with its capability to have multiple representations on one page.

Part V: The Lists & Spreadsheet Application

Your experience with computer-based spreadsheet applications really pays off here. If words such as *fill down, cell,* and *formula* sound familiar, you'll have little trouble figuring out how to navigate this application. I also get into combining the Lists & Spreadsheet application with the Graphs, Geometry, or Data & Statistics application to perform regressions and investigate scatter plots.

Part VI: The Data & Statistics and Vernier DataQuest Applications

If you are working with the Lists & Spreadsheet application or the Calculator application, this application is perfectly suited for one- and two-variable analysis. In this part, you discover how to create and analyze a host of different

statistical graphs, including dot plots, histograms, box plots, scatter plots, and summary plots. New color features allow incredible-looking comparative data representations. I also introduce Data Collection, a feature that works in conjunction with the Graphs, Geometry, Lists & Spreadsheet, and Data & Statistics applications.

The Vernier DataQuest application provides you with data collection tools that you have only dreamed of! Three views allow multiple representations of the data. Customize the data by selecting only the part of the data you would like to analyze. Using Lab Cradles, digital probes are now available. In addition, multiple probes are available using USB connections to a computer. If you are used to using EasyData on the TI-84, this application will blow you away!

Part VII: The Notes Application

The Notes application is the glue that holds together TI-Nspire's other applications. Simply put, this application makes the document model possible, eliminating the need to add paper to your activities as well as providing the continuity that makes your documents flow. You will find out how math expression boxes can become dynamic, linking interactively with the other applications.

Part VIII: TI-Nspire Computer Software

In this part, I talk about how TI-Nspire Computer Software makes a connection between your handheld device and your computer, allowing you to transfer files, take pictures of your handheld screen, back up your device, and upgrade the operating system.

TI-Nspire Computer Software allows you to quickly create and edit documents that are completely compatible with those that reside on your handheld device. In addition to providing the nuts and bolts of how to use this software, I give you several reasons why you might want to use it in the first place. I think you will agree that using the software to add a color image to the background of a Graphs page is bad to the bone!

Part IX: The Part of Tens

In Part IX, I give you a lot of good information — *quickly.* Here, I summarize ten great tips and shortcuts, periodically mentioned throughout the book, that are sure to save you lots of time. Finally, I resolve some common