Too Much to Do and Too Little Time? Consider the TI-Navigator™ System.

By Heather Basse-McMonagle
Lakeside Middle School
Millville, NJ

With all of the new initiatives in education like data-driven instruction, differentiated instruction and Adequate Yearly Progress (AYP), teachers are now doing the job of several people with the time and resources of only one. We’re expected to serve not only as teachers, but also as counselors, surrogate parents, statisticians and curriculum developers. This can seem a real challenge.

The TI-Navigator™ classroom learning system helps with that challenge. It is like having your own personal data analyst and teaching assistant right in the classroom.

Forget the days or weeks you have spent grading, analyzing and reviewing student work. Now you can have all of that and more with just the press of a button. The TI-Navigator system makes it possible to give students instant feedback, while you receive a detailed analysis of each answer from each student, all in a matter of seconds.

Grading tests with the push of a button

Wouldn’t it be great if you could grade tests with the push of a button? If you could get the important information you need from tests and quizzes without spending too much time grading them? Would you like a quick and easy way to use the results of assessments to have meaningful discussions with your class, helping you determine where to go next?

The TI-Navigator™ classroom learning system ... is like having your own personal data analyst and teaching assistant right in the classroom.

With the press of a button in Class Analysis, the TI-Navigator system grades student assessments, prepares detailed item and individual analysis, and even develops a slideshow for quick review. This lets you immediately review the results with your class, and allows you to spend meaningful time with your students, using the data to drive your instruction.

Continued on page 3
We as educators put a great deal of time and effort into developing lesson plans that focus on helping our students grow and gain knowledge. As a result, we sometimes neglect our own needs as education professionals. We strive to offer the best of ourselves to our students. After all, that is our passion. We do need, however, to better ourselves in order to give them that “best.”

A possible starting point for professional growth is sharing ideas with colleagues. Experienced teachers have lesson gems to offer teachers just entering the field of teaching, while new teachers have new techniques to offer in exchange. Let’s make sure, then, to learn from each other.

Technology offers many opportunities for professional growth. Knowing how to use it effectively with your students may be second nature to some of you, yet more challenging to others. Share your ideas, your lessons and your expertise with one another. Use some of your department meeting times to participate in the free online courses TI offers on their Web site at education.ti.com. As you plan your year, please consider what you are going to do for you. You have already made a start: you are reading TI-Navnews. I wish you a fantastically rich school year. Enjoy!

What plans do you have for your own professional growth this year?

From the Editor
By Jane Damaske

Consider the TI-Navigator™ System continued

Spend more meaningful class time with your students

Imagine every classroom with two teachers, so that each student could be assessed and assisted faster. With features like Screen Capture, you can check everyone’s work in the time it takes your computer screen to load.

You can see who understands, who doesn’t, and who is not following the lesson. You can then easily differentiate your lessons to meet the needs of the students at that exact moment.

Send the students who are progressing well an extension activity. This lets you work with students who are struggling, or use the time at the end of class to create groups for the next class.

Give every student the ability to explore and contribute

How would you like it if all of your students were comfortable enough to solve problems and ask questions without anxiety? If you could have every student answer every question so you knew at all times what every student was thinking? The TI-Navigator system makes this possible, too.

The Activity Center gives every student the ability to explore and contribute to the class at the same time. You can set up hands-on activities that allow students to:

- Locate numbers on a number line
- Answer surveys and share results with the class
- Conduct experiments and compile real sets of relevant data in just minutes
- Write equations to match pictures or graphs that have been displayed
- Interpret situations and share graphs that depict the situations
- Practice coordinate graphing by plotting points
- Model situations with visual fractions

The best part about it is that the students can instantly see their results and self check, with only the teacher and the individual student knowing that it is theirs. It is the ideal place for students to explore ideas without the fear of failure.

Capture and engage today’s “digital natives”

Can your students be as interested in your class as they are in their cell phones, texting, MySpace, video games and computers? Can they be motivated and engaged on a daily basis? The reality is that today’s students are “digital natives” being taught by digital immigrants.

The TI-Navigator system and its many capabilities help to capture and engage the minds of these digital natives effortlessly. They have options and feel valued. They are receiving constant stimulation and instant feedback, which keeps them excited about learning.

At a time when so many people are looking for ways to “fix” this generation, it is our job to find ways to reach them and teach them the skills they need to be successful in the future. The TI-Navigator system is the answer to my teaching wishes and more. It has changed my classroom, the lives of my students, and the way I teach for the better.


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In my own words

Helping All Students Take Part in Math Learning

By Cindy Johnson
Thunder Ridge Middle School
Centennial, CO

As I have learned more and more about graphing calculator technology – and as I have begun incorporating the TI-Navigator™ system into my classroom – there is one area of focus for me: the idea of access for all students to higher level thinking in mathematics.

In talking to colleagues, I have often found that teachers are comfortable using technology with their best students, but not the struggling ones. I was guilty of this myself when I first began using graphing calculators. It is the idea of access for all, however, which has caused me to pause, think and adapt my own teaching.

Graphing calculator access for every student

Within the past year, I’ve had excellent training opportunities. One opportunity was to become part of a three-year cadre within my school district to study mathematics intervention research and develop a better plan for working with students who need this intervention. As I have learned more, I have developed a passion for bringing graphing calculator technology into the hands of students who have the most difficult time learning mathematics.

We have all had students in our classroom who have serious difficulties with different mathematical concepts. Take, for example, students who have difficulty with motor function. If we asked these students to make a scatter plot by hand – drawing the axes, scaling the axes equally, and graphing the data – the task itself would be daunting and extremely time consuming.

These students become so overwhelmed with the task of creating a graph, that they rarely get to the point where they are actually analyzing the data in the graph. In other words, these students tend to stay at the lower end of Bloom’s Taxonomy rather than advance to the higher end. As a result, their learning of mathematics becomes somewhat stagnant.

Opening the door to mathematics

Using graphing calculators and the TI-Navigator system takes the tedium away for these students and opens the door to mathematics. Skills are still needed to create the graphs on the calculators. Setting the window for the graph still allows students to show that they understand how to scale their axes.

However, by using the technology to create the graph, students can then work on analyzing what the data means rather than being “lost” in discussions because they either couldn’t or wouldn’t do their work.

Full engagement in mathematics learning

I have also found that by using the graphing calculators and the TI-Navigator system in my classroom, my students who struggle, as well as my usually unmotivated students, are now fully engaged in mathematics learning.

The technology allows all students a chance to participate in the learning without being put on the spot. Students can take risks without feeling like everyone is going to think they are “stupid” if they get the solution wrong. Because students are more engaged in class, they are bound to learn more as a result of their effort.

From a teaching perspective, I am more aware of the abilities of my students on a day to day basis than ever before. I have never been one to teach the same way I did last year, but I now find myself able to alter my lessons on the spot, sometimes several times in one class period, to ensure all students are understanding the lesson.

Addressing student needs as they happen

The power of using the technology for formative assessment has helped me to address the needs of students as they arise, rather than waiting until after a quiz to find out whether or not a concept is understood.

Through the use of Quick Polls, I can immediately tell if students are ready to move on or if I need to spend more time on the targeted concept. I can also tell immediately if there are some students in the room that I need to check with individually.

Another benefit is that questions from my students have become more focused. Instead of just saying, “I don’t get it,” students are now asking specific questions.

The use of graphing calculator technology in my classroom has opened my eyes to a whole new realm of teaching. I feel that I am more effective than ever with students who are struggling in math, and that I am challenging my students in a new and different way.

By using the technology to create the graph, students can then work on analyzing what the data means rather than being “lost” in discussions because they either couldn’t or wouldn’t do their work.
Overview:
The beginning of the year is a great time to learn some facts about your new group of students. Quick Poll provides a fun way to glean that data from them.

Procedure:
Have your students answer a Quick Poll question that asks them to identify their birth month in numbers (i.e., January = 1, February = 2, etc.). The Quick Poll data can be entered into a list on the calculator so students can find the mean, median and mode of the data set.

Have students identify the advantages of each measure of central tendency. Students can then take the data and display it graphically. Because of limitations of the range display for numbers on the graphs, students may have to make two graphs or make a graph with intervals to represent the range of the months. Use Screen Capture to display the students’ graphs. As the teacher, you could show students the graphed data on the computer and then compare the graphs to those on the calculator.

To Construct a Printable Image:
After the students log on they should go to Activity Center. They will receive a form from the teacher asking them to enter their birth month and birth date (Figures 1 and 2).

The teacher can send the aggregated data to the students in lists with Activity Center (Figure 3). Once the students receive the lists, the teacher will stop the activity. The students can then exit the TI-Navigator application. The data are in their calculators as List 1 and 2. This data list can also be used for the different graphs which the teacher can display with a class screen capture for discussion. You will have a printable grid that you can copy to your WORD document.

Parabolas and Lines of Symmetry

Overview:
Some students have difficulty understanding the concept of the line of symmetry in parabolas. They know that the curve has one, but exactly where that symmetry is and what equation describes it can be troublesome. The TI-Navigator system is a great help in teaching this concept.

Procedure:
- Go to the Activity Center and select Contribute Equations. Configure them the way shown in Figure 1. If your class is small, you may want 2 equations per student. Before you start the activity, click on the Zoom Standard icon followed by the Zoom Square icon. Have the students add a number between -10 and 10 to the x^2+4x and send it. Once you have all of the equations on the screen and displayed for the students to see, have the students make a conjecture of what the equation for the line of symmetry is.
- Next, choose View, Show X= Entry. Type in the value the students came up with and see if it works. If it needs to be modified, hide it and try again. Do it until all the students agree it is the correct line of symmetry. (It should be x = -2 for this equation.)
- You can clear the Activity Data and try it again with a different starting equation for Y1. After several of these examples, students can determine that the equation of the axis of symmetry is x = -2. The power of the TI-Navigator system lies in the ability to look at many cases in a very short period of time!
Gaining or Losing Yards

By Enedelia Rios  
Grade 7 Teacher, Rio Grande City, TX

MATHEMATICS (ALGEBRA 1)

Concepts:
- Positive and Negative Integers
- Math Operations

Overview:
This activity will allow students to use the football field as a model for adding, subtracting, multiplying and dividing integers. Many students are familiar with the gain or loss of yards in football but may not realize that addition and subtraction of integers takes place throughout a football game.

Objective of Activity:
- Students will develop an understanding of operations with integers.
- Students will see the relationship between gaining or losing yards in football and math integers.
- To score a touchdown while performing math operations.

Teacher’s Instructions:
TI-Navigator™ Activity Setup:
- Open Activity Center.
- In the Contribute pull-down menu select Points.
- Press Configure and set the fields as shown in Figure 1.
- Click on File, then Load, and then Load Background image, and load the picture found in Activity # 7457 on Activities Exchange at education.ti.com/exchange.

Procedure:
- Distribute the handouts, coins and dice.
- Go over the rules of play.
- Pair students for the activity.
- Play the game and record outcomes on the recording sheet, which will be collected at the conclusion of class.

Student Responsibilities:
The activity will consist of a set of coin tosses and four rolls of dice which represent the 4 downs in football. Follow these steps:
- Flip the coin. If the coin lands Heads, multiply the first roll by 5.
- If the coin lands Tails, multiply the last roll by 2. Record your outcome in the recording sheet.
- Roll the dice and record the outcome.
- Roll the dice a second time and record the outcome.
- Roll the dice a third time and record the outcome.
- Roll the dice a fourth time for the first down and record the outcome in the recording sheet.
- After the fourth roll, refer to the recording sheet and perform the math operations that need to be done.
- Once recorded and performed in the Activity Center, carry out the algorithms that were recorded on the recording sheet.

Materials:
- TI-Navigator™ classroom learning system
- TI-73 Explorer™ graphing calculators
- Coins and Dice
- Handouts: Gain or Losing Yards, Recording Sheets
- Files: Background image in Activity Center

To make sure the game is played fairly, the opponent will verify that the algorithms were carried out correctly. If the opponent should find any errors, then as a penalty the player will stay in the same position.

At this point the partner (opponent) will perform his or her 4 downs in the same way as the example.

Example 1: Flipping Heads, rolling a 3, 4, 1, 6.
Use your TI-73 Explorer calculator to conduct the four operations.
- The coin landed Heads, so multiply the first roll by 5.
- The second roll was a 4.
- The third roll was 1.
- The fourth roll was 6.
- \([ (5 \times 3) - 4 + 1 - 6 ] \) = \([ 15 - 4 + 1 - 6 ] \) = \([ 11 + 1 - 6 ] \) = \([ 12 - 6 ] \) = 6
- In the first run, this person will gain 6 yards.
- At this point the opponent will perform his or her 4 downs the same way as Example 1.

Example 2: Flipping Tails, rolling a 3, 4, 1, 6.
Use your TI-73 Explorer calculator to conduct the four operations.
- The coin landed Tails, so multiply the last roll by 2.
- The first roll was a 3.
- The second roll was a 4.
- The third roll was 1.
- The fourth roll was 6, so multiply by 2.
- \([ 3 - 4 + 1 - 6(2) ] \) = \([ - 12 ] \)
- In the first run, the student will lose 12 yards.
- At this point the opponent will perform his or her 4 downs the same way as Example 2.

Note: A coin will be tossed once for every run.
- If coin lands HEADS, multiply first roll (the number on the die after you roll it for the first time) by 5.
- If coin lands TAILS, multiply the last roll (the fourth down by 2).
**TI-Navigator** Activities

**MATHEMATICS (ALGEBRA 1)**

**Tying Knots**

By Fred Ferneyhough

Ontario, Canada

**Procedure:**

- Break the class up into groups of three students. Provide each group with a rope. The ropes should have the same thickness and different lengths. Students will be measuring the initial length of rope and the length after tying knots in the rope. Be sure to instruct students to tie knots that do not overlap.

- Complete the table:

<table>
<thead>
<tr>
<th>Number of knots</th>
<th>Length of rope</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
</tr>
</tbody>
</table>

- Place the data into L1 and L2 on the calculator.

- In Y1, store the equation of a line of best fit that will pass through the points. This equation could be found by either doing a regression or by trial and error.

- While students are working, start the TI-Navigator system, begin class and launch Activity Center. Change the window settings as shown. The axes labels are an option that you could choose (Figure 1).

- Choose Contribute Equations. Press the Configure button and change the settings as shown in Figure 2.

- Have students enter the TI-Navigator system and go into Activity Center. When the option arises, they should send their equation to the teacher. The group’s equation should appear as a line in Activity Center (Figure 3).

- Ideally, the lines should be parallel. It may be necessary to discuss the manner in which knots were tied and ensure that different groups were using the same level of “tightness” in their knots. If any of the lines intersect, you may wish to have students repeat the experiment.

- Discuss why the lines are parallel by discussing slope and y-intercept.

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**Quick Poll**

Quick Poll is a great way to get started with the TI-Navigator system, but I have found the Time Stamp feature of Quick Poll to be a great supplement to the math games I play in my class. In one test review, I used the Time Stamp to hold a “Battle of the Sexes.” After asking the class a review question and completing a poll, I used the Time Stamp to reward a point to the first five people who answered correctly. Additionally, in order to provide more students the chance to score, I made those five students who just earned a point for their gender or group ineligible to answer the next question. In all, the Time Stamp is a neat feature I have used with the many Jeopardy® games I have assigned in the past.

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**Two of my favorite features of the TI-Navigator system are the “Send To Class” and the “Collect From Class” features. Whether it is a LearningCheck™ file, an Activity Center equation, list, form or even the occasional Quick Poll, there might be a student who was not able to receive the information sent to the class. If this happens, try this trick. Have the student exit the NavNet App all the way to the blank calculator home screen. Double click to make sure the cable is securely plugged into the calculator and the hub. Then have the student log back into NavNet. The calculator will go directly to the information that was being sent or retrieved. It has worked every time in my class.”

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**Janna Smith**

Vidor TX

**Robert Lochel**

Hatboro-Horsham High School

Hatboro, PA

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**“Topic and Keywords” fields in LearningCheck™ are very important if you want to reuse questions and combine them from different tests. If you haven’t been doing this, I recommend you give it a try. If you need to clear your item bank records and start again, here are the directions to follow. Make sure you can see “hidden folders.” Go to your Control Panel and launch Folder Options. Under the View Tab, make sure that you select “Show hidden files and folders.” If you want to start with a clean item bank, you should delete the following items if they are present:

- **C:**\Documents and Settings\All Users\Application Data\Texas Instruments\itemRepository
- **C:**\Documents and Settings\All Users\Application Data\Texas Instruments\itemRepositoryBackup

You can also delete the keywords and topics from the following location (this is not necessary, but convenient if you want to clean up your current list):

- **C:**\Documents and Settings\Username here\Application Data\Texas Instruments\TI LearningCheck Creator\profiles

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**Corey Boby**

Malvern, AR

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By Fred Ferneyhough

Ontario, Canada

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**As an educational consultant, I frequently travel with my TI-Navigator® system to conduct teacher training sessions and workshops. I have found that storing the system in a tool box on wheels has helped me keep track of the components of the system. The tray in the tool box is used to store the link cables. The foam from the original packaging is used as cushioning for the system in the tool box. I am even able to transport 32 calculators with the system in this box. Everything fits perfectly and travels well!”

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**Robert Lochel**

Hatboro-Horsham High School

Hatboro, PA
As an Academic Math Coach, I don’t have just one classroom in which I teach and work. To share the TI-Navigator™ system with other educators and administrators, I transform myself into a “traveling salesman.” And to keep my “wares” organized so that I can set up and take down quickly, I have developed a system that works for me. Here are a few pointers.

- To load all of the equipment and materials, I use a cart on wheels with dimensions of 18" x 16" x 15.5"
- I also use a Sterilite rectangular plastic box with a lid, which holds 23 graphing calculators
- Extra calculators can fit between the box and the inside of the cart
- A computer bag fits on top of this, with room for handouts
- An open box on wheels fits on top, holding the hubs, cords, clamps, access point and cards

To save time, I already have all links attached to the hubs. On each hub, colored adhesive strips keep the links bundled together. I secure these to the hub with a strip of the same color so students can keep them all together – and so they don’t get tangled or interfere with the connection to the charger. These strips come in packs of five colors, so I can use four for each hub and one for the access point and computer cords.

On arrival, I first set up the computer and access point. Several times I have been in buildings that have wireless frequencies that have interfered with the communication between access point and hubs. So, even before I take them out of their chargers, I check to see if they are recognized on the computer. If not, I have to change channels to find one available frequency. If I need assistance, I call 1.800.TI.CARES.

As the hubs begin to show up on the Network Manager, I set the clamps, attach the hubs, place the Username/password cards on the desk, and usually leave a handout. On my cards I have the Cabri™ Jr. geometry application menus on the back as a quick reference and the login steps on the front for ready access.

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Clean-up is a snap. When I finish with the session, each group member has a job. One collects the cards, one the hubs, one the calculators and one the clamps. If I have given an assignment, they put this on the table as they leave. I take care of the computer and the access point. Back into the cart goes (1) the calculators, (2) computer and handouts, (3) the box with all of the other equipment, and away I go to the next group of enthusiastic educators.

Vicki Mixon
The TI-Navigator system is a stand-alone wireless network. Security is provided to protect all of the data being passed around. Although there is usually no sensitive student data in the bursts of information, called packets, that the TI-Navigator system sends and receives; security is always a top concern.

The TI-Navigator system uses a common network encryption standard to encrypt the data sent over the network. The packets sent by the network are encrypted and decrypted using a generated... system uses randomly generated keys, which are rotated weekly in order to maintain the safest network possible.

**Why should you update your encryption keys?**

- Only takes a few seconds, and one click of a button to update.
- Keeps the TI-Navigator network safe and secure.

Every 7 days, you will receive the Key Update warning. All you need to do is make sure that the hardware is connected and working, and then click the Change Keys button. This will begin the... after 24 hours. You can also change the keys at any time by opening TI Network Manager, and clicking Actions and then choosing Change Keys.

Josh Schneider
TI-CARES Technical Escalations Level II

**WEP Key Update Notice Explained**

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- Keeps the TI-Navigator network safe and secure.

**FREE Activities at the Activities Exchange**

Visit Activities Exchange where educators can go online to post, search for and discover numerous classroom activities that use the TI-Navigator system. Best of all, it’s FREE!

Visit education.ti.com/exchange often to find innovative classroom activities from educators around the globe, and feel free to add your favorite exercises.

**TI-CARES Customer Support**

We’re here when you need us, for TI-Navigator system set-up, software downloads and everything in between. Feel free to call or e-mail us with your questions regarding your system.

1.866.846.2844
ti-navigator@ti.com
education.ti.com/support

**Mark Your Calendar**

**2008 T³ – Teachers Teaching with Technology® Regional Conferences**

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Contact Information</th>
</tr>
</thead>
</table>
| Salem, VA  | October 3-4 | Kevin Simms and Mark Baetz
             |            | ksimms@salem.k12.va.us                       |
| Portland OR| October 9-11| Jackie Nissen
             |            | jnissen@comcast.net                           |
| Wilmington, DE | October 10-11 |    |
|             |            | Susan McCune
             |            | susanmcune@comcast.net                        |
| St. Louis, MO| November 14-15 |    |
|             |            | Jane Barnard and Jim Haskins
             |            | janebarnard@charter.net                       |
| Biloxi, MS  | November 14-15 |    |
|             |            | Vicki Shirley
             |            | vs Shirley@corinth.k12.ms.us                  |
| Salem, VA  | October 3-4 | Kevin Simms and Mark Baetz
             |            | ksimms@salem.k12.va.us                       |
| Portland OR| October 9-11| Jackie Nissen
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| Biloxi, MS  | November 14-15 |    |
|             |            | Vicki Shirley
             |            | vs Shirley@corinth.k12.ms.us                  |

**Where to Buy the TI-Navigator® System**

**UNITED STATES**

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<thead>
<tr>
<th>State</th>
<th>City</th>
<th>Contact Information</th>
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</thead>
</table>
| CA     | Bach Company | 800.248.2224
        | School Savers | 800.221.2120
        | DMH Distributing | 800.340.1906
| CA, PA, TX, FL, IL, MA | Scantex
        | Educational Electronics | 800.526.9060
        | Electronic Products, Inc. | 800.843.7017
        | EAI Education | 800.770.8010
        | SchoolMart | 800.285.2662
        | TechLine | 800.777.3635
        | Underwood Distributing | 800.753.3570
        | COFCO | 800.446.7021
        | Vernier Software & Technology | 888.837.6437

**UNITED STATES**

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<th>State</th>
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<th>Contact Information</th>
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| TX     | Wholesale Electronics | 800.880.9400
        | UT Valley Business Machines | 800.462.2019
        | WI, NV Douglas Stewart | 800.279.2795

**CANADA**

<table>
<thead>
<tr>
<th>Province</th>
<th>Contact Information</th>
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</table>
| ON      | OTTAWA CCS Educational
          | Spring 2009
        | 877.227.3382
| QC      | Thalès Technologies Inc.
          | 866.669.2221
| CA      | CANADA SCHOOL ONLY
          | 800.340.1008
| NU      |    |
| OR      |    |
| MB      |    |
| AB      |    |
| SK      |    |
| AB      |    |
| NB      |    |
| NS      |    |
| PE      |    |
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| MB      |    |
| NB      |    |
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| NF      |    |

**PUERTO RICO**

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<th>State</th>
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</table>
| PR     | Precision Instruments & Technology
          | 787.287.3715
| CT     |    |
| WI     |    |
| OR     |    |
| MI     |    |
| IA     |    |
| MO     |    |
| LA     |    |
| TX     |    |
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| SD     |    |
| NE     |    |
| KS     |    |
| AR     |    |
2009 International Conference
SEATTLE, WA

Washington State Convention and Trade Center
February 27 - March 1, 2009

For Information and Registration Visit:
education.ti.com/go/t3seattle

The TI-Nspire™ handheld with the TI-84 Plus keypad snapped in works with the TI-Navigator™ system

The current TI-Navigator System is fully compatible and functional with the TI-Nspire handhelds using the TI-84 Plus Keypad included with them.

PLUS! A NEW TI-Navigator system specifically for TI-Nspire handhelds is in development!

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