



Objectives

- To become familiar with the various data aggregation capabilities of the TI-Nspire™ Navigator™ System.
- To discuss various activities and concepts that can be enhanced by the use of data aggregation.

About the Lesson

- Participants will work together to practice data aggregation.
- One member of the group will play the role of the teacher while others play the roles of students.
- Participants will change roles until all members of the group feel comfortable with aggregating data.
- Participants will discuss the types of activities and concepts that can be explored using data aggregation.

TI-Nspire™ Navigator™ Features

- Collecting student-generated data
- Returning compiled data for analysis

Roles

TI-Nspire™ Navigator™ System

Working in pairs, one participant will assume the teacher role—the other, the student role. The “teacher” will operate the computer, and the “student” will operate two TI-Nspire handhelds. Each participant will have an opportunity to change and experience both roles.

TI-Nspire™ Navigator™ NC System

Working in groups of three, assign one role as the teacher and two roles as the students. The “teacher” will use the TI-Nspire Navigator NC Teacher Software, and the “students” will use the TI-Nspire Student Software. Each participant will have an opportunity to change and experience both roles.

What is Data Aggregation?

An important learning tool of the TI-Nspire Navigator System is the ability to collect individual student data and combine it into one data set. TI-Nspire Navigator allows the teacher to send the aggregated data set back to the individual students for investigation.

TI-Nspire™ Technology Skills:

- Answering Coordinate Points & Lists Quick Poll questions
- Entering and submitting data as requested
- Submitting a Quick Poll response

Tech Tips:

- Data aggregation is accomplished by collecting data through a question page.
- Aggregated data is sent back to the students through a document.

Lesson Materials:

Equipment for the TI-Nspire™ Navigator™ System

- Computer with TI-Nspire™ Navigator™ Teacher Software (for a pair of participants) with two USB ports
- Two TI-Nspire™ learning handhelds per participant
- Standard A to Mini-B USB cables

Equipment for the TI-Nspire™ Navigator™ NC System

- Computer with TI-Nspire™ Navigator™ NC Teacher Software and TI-Nspire™ Student Software



There are three main steps in this process:

1. Collecting data from the students.
2. Aggregating the data.
3. Sending the aggregated data back to the class.

Aggregating the data is accomplished using a **Coordinate Points & Lists** Question Type which has three options: (x,y) Numerical Input, Drop Points, and List(s).

Data Aggregation Using (x,y) Numerical Input

Data aggregation using the Question Type **(x,y) Numerical Input** is visually useful for students accustomed to the ordered pair relationship.

Individual student data → Data collected from class → Aggregated data sent back to class

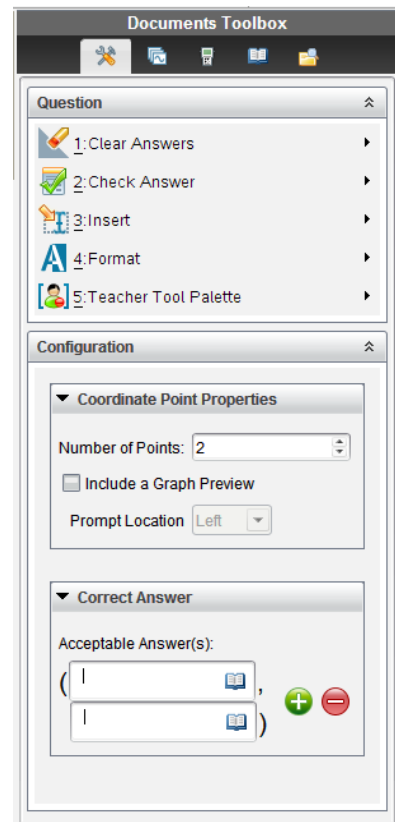
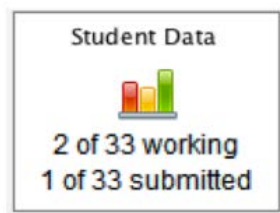
1. After the TI-Nspire Navigator class has been started and students have logged in to class, click the Quick Poll icon.
2. Select the Question Type **(x,y) Numerical Input**, and click **Insert**.
3. If desired, enter instructions for the students in the question field. A sample question is shown.



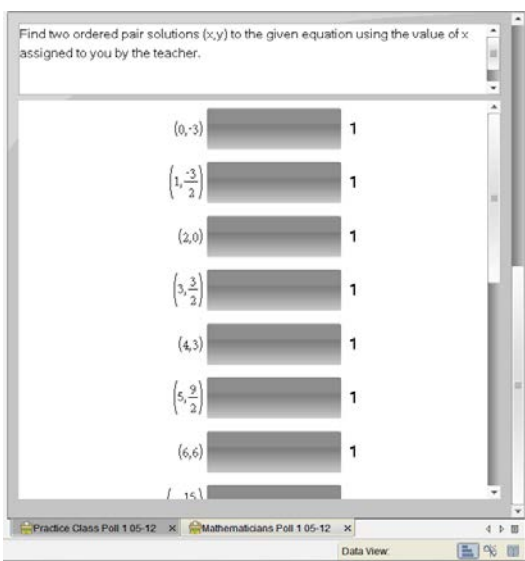
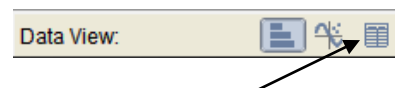
Coordinate Points & Lists
 (x, y) Numerical Input



4. If desired, make adjustments to the configuration of the data being collected such as Number of Points, Graph Preview, and Prompt Location.
5. After the question is set up appropriately, send it to the class by clicking **Start Poll**.
 - The Review Workspace immediately opens, allowing the teacher to monitor the class progress.
6. Students enter their data and submit when finished.
 - The teacher can monitor the collection of the data in the Review Workspace using the Student Data icon.



7. When all students have submitted their data, the teacher can view the data by clicking on the **Student Data** icon.
8. Change the Data View to the Frequency Table.



Response	Frequency
$(-1, \frac{-9}{2})$	1
$(-6, -12)$	1
$(0, -3)$	1
$(4, 3)$	1



9. Right-click on the Frequency Table, and select **List View**.
10. Right-click on the List View table, and select **Send Table to New Document**.
 - The new document opens with the aggregated data in a Lists & Spreadsheet page in the Documents Workspace.

Student	X	Y
Euclid	-1	-9/2
Pierre Fermat	-6	-12
Hypatia	0	-3
Euclid	4	3
Albert Einstein	7	15/2
Charles Babbage	-5	
Hypatia	5	

11. Delete the extraneous information (student names) and rename the lists.
12. Send the document to the class for investigation.
 - For more details, see the section “Returning Aggregated Data to the Class” at the end of this activity sheet.

xcoord	ycoord		
-1	-9/2		
-6	-12		
0	-3		
4	3		
7	15/2		

Reflection:

What is another data aggregation activity that would be useful in the classroom using this method?

Data Aggregation Using Drop Points

Data aggregation with the Drop Points Question Type is visually useful for gathering ordered pairs from a coordinate grid.

Individual student data → Data collected from class → Aggregated data sent back to class

The first screenshot shows a question interface with a coordinate grid and a rock formation image. The second screenshot shows the same question interface with a coordinate grid overlaid on the rock formation image, and several points (red and blue) are placed on the grid. The third screenshot shows a spreadsheet with the aggregated data points:

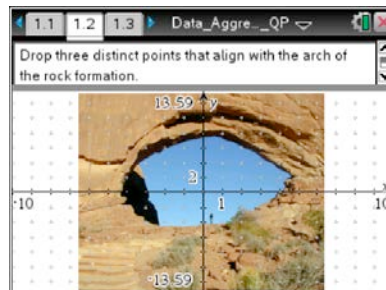
xcoord	ycoord		
-2	6		
0	8		
1.57233	6.49192		
4.5283	2.51021		
-2	6		



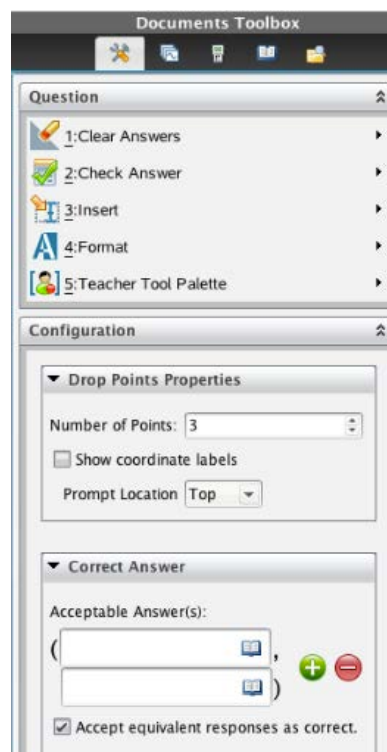
1. After the TI-Navigator class has been started and students have logged-in to class, click the Quick Poll icon.
2. Select the Question Type **Drop Points**, and click **Insert**.
3. If desired, enter instructions for the students in the question field. A sample question is shown.

Coordinate Points & Lists

Drop Points

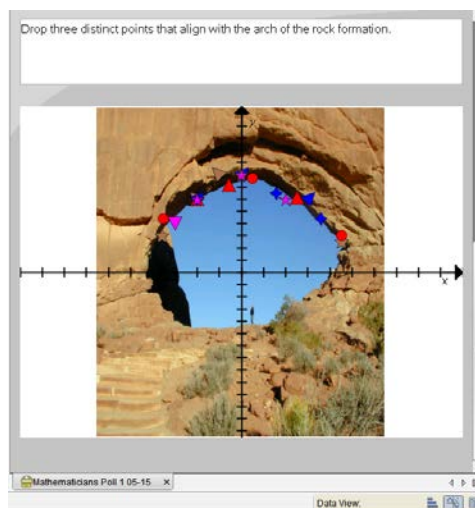


4. If desired, make adjustments to the configuration of the data being collected such as Number of Points, Show coordinate labels, Prompt Location, Acceptable Answer(s), and Accept equivalent responses as correct.
 - To insert an image onto the coordinate grid, choose **Insert > Image** on the software tool bar.





- After the question is set up appropriately, send it to the class by clicking **Start Poll**.
 - The Review Workspace immediately opens, allowing the teacher to monitor the class progress.
- Ask students to drop their points and submit when finished.
 - The teacher can monitor the collection of the data in the Review Workspace using the Student Data icon.
- When all students have submitted their data, the teacher can view the data by clicking on the **Student Data**.

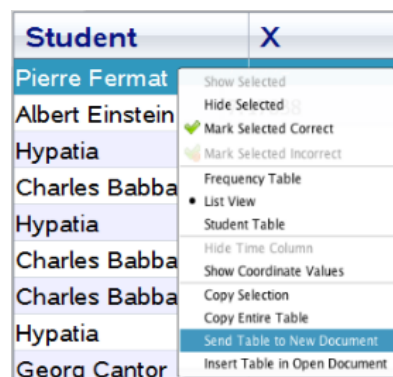


- Change the Data View to the Frequency Table.

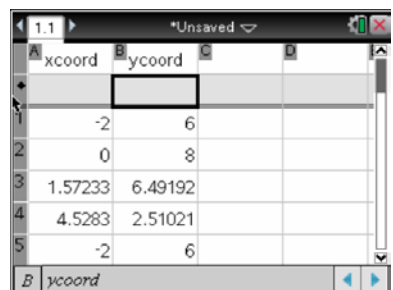


Response	Frequency
$(-2,6)$	5
$(0,8)$	3
$(1.57233,6.49192)$	1

- Right-click on the Frequency Table, and select **List View**.
- Right-click on the List View table, and select **Send Table to New Document**.
 - The new document opens with the aggregated data in a Lists & Spreadsheet page in the Documents Workspace.



- Delete the extraneous information (student names), and rename the lists.
- Send the document to the class for investigation.
 - For more details, go to the section "Returning Aggregated Data to the Class" at the end of this handout.



Reflection:

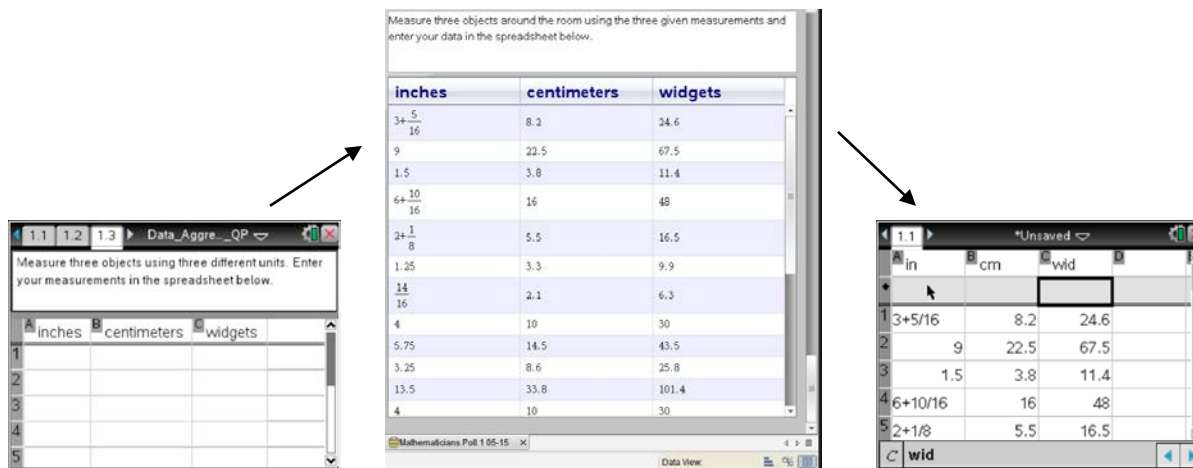
What is another data aggregation activity that would be useful using this method?



Data Aggregation Using Lists

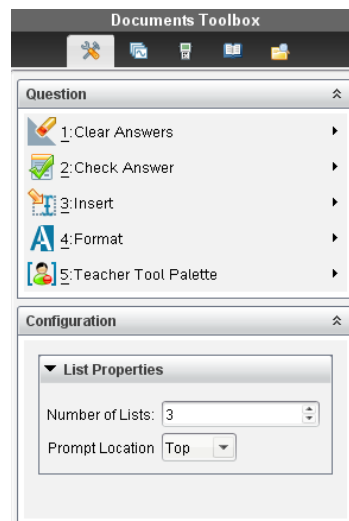
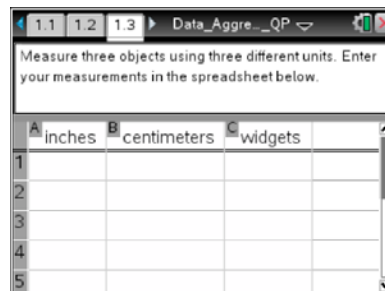
Data aggregation using the List(s) Question Type is useful to gather data. In this type of question, the number of lists can range from one to five.

Individual student data → Data collected from class → Aggregated data sent back to class



1. After the TI-Navigator class has been started and students have logged into class, click the Quick Poll icon.
2. Select the Question Type **List(s)**, and click **Insert**.
3. If desired, enter instructions for the students in the question field. Name the lists as appropriate for the question. A sample question is shown.
4. If desired, make adjustments to the configuration of the data being collected such as Number of Lists and Prompt Location.

Coordinate Points & Lists
List(s)





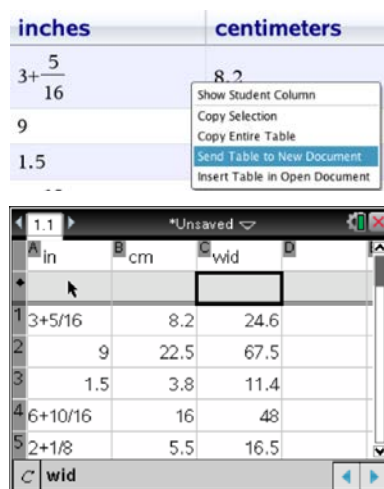
5. After the question is set up appropriately, send it to the class by clicking **Start Poll**.
 - The Review Workspace immediately opens, allowing the teacher to monitor the class progress.
6. Have students enter their data and submit when finished.
 - The teacher can monitor the collection of the data in the Review Workspace using the Student Data icon.
7. When all students have submitted their data, the teacher can view the data by clicking on the **Student Data**.

Measure three objects around the room using the three given measurements and enter your data in the spreadsheet below.

inches	centimeters	widgets
$3 + \frac{5}{16}$	8.2	24.6
9	22.5	67.5
1.5	3.8	11.4
$6 + \frac{10}{16}$	16	48
$2 + \frac{1}{8}$	5.5	16.5
1.25	3.3	9.9
$\frac{14}{16}$	2.1	6.3
4	10	30
5.75	14.5	43.5
3.25	8.6	25.8
13.5	33.8	101.4
4	10	30

Mathematicians Poll 1 05-15 x Data View.

8. Right-click on the list view table, and select **Send Table to New Document**.
 - The new document opens with the aggregated data in a Lists & Spreadsheet page in the Documents Workspace.
9. Send the document to the class for investigation.
 - For more details, go to the next section “Returning Aggregated Data to the Class”.



Reflection:

What is another data aggregation activity that would be useful using this method?



Returning Aggregated Data to the Class

The third step of the Data Aggregation process is sending the aggregated data back to the students for investigation. This is achieved by placing the aggregated data into a document and sending the document to the class. The document can be a one page document containing the raw data or the document can be several pages with the raw data, the graph of the data, investigative questions, and other pages as desired.

When the teacher selects **Send Table to New Document** from the view of the data in the Review Workspace, the new document opens with the aggregated data in a Lists & Spreadsheet page in the Documents Workspace.

1. If necessary, delete the student name information in the first column.
 - Click on a cell in the first column.
 - Select **Menu > Actions > Select > Select Column**.
 - Press **Delete** on the keyboard.
2. If desired, add a Graphs page or a Data & Statistics page and set up a graph of the data.
3. Click **Send to Class**.
4. Students can open the document and investigate the data as directed by the teacher.

	xcoord	ycoord
1	Hypatia	-2 6
2	Albert Ein..	-2 6
3	Euclid	-2 6
4	Charles B..	4.5283 2.51021
5	Euclid	0 8