Distributions of Data

by – Paul Alves

Activity overview

This activity was developed for the Grade 11 College course in the Ontario curriculum. In that course students are expected to identify and describe properties associated with common distributions of data (e.g. normal, bimodal, skewed). Students will plot data that has either been provided in Lists and Spreadsheets or run a simulation in Lists and Spreadsheets.

Concepts

Creating a histogram; data distributions.

Teacher preparation

Students should have had some practice creating representations of data manually and with the help of technology. Students should be familiar with the different types of one-variable data (discrete, continuous and categorical) and the different ways to represent data (bar graph, circle graph, histogram, line graph, etc.). The Nspire file (Distributions of Data) should be loaded onto student handhelds.

Classroom management tips

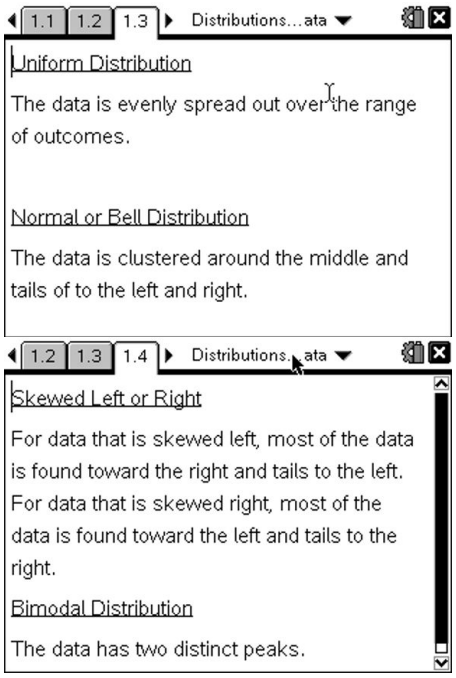
Students can be paired for the activity.

TI-Nspire Applications

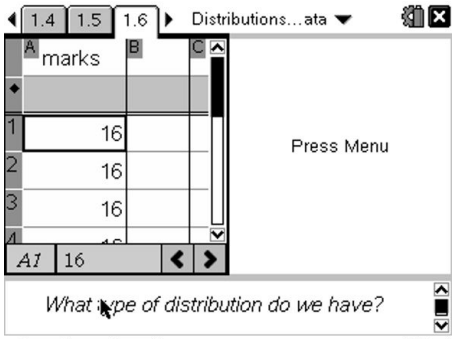
Lists and Spreadsheets; Data and Statistics

Step-by-step directions

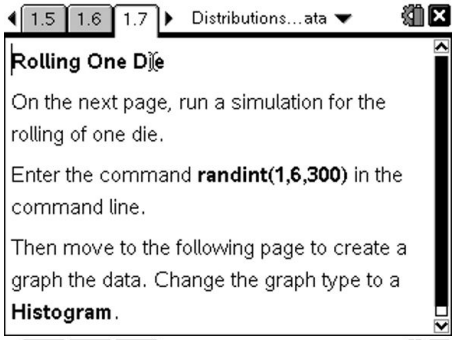
Students read definitions of different distribution types on 1.3 and 1.4. Students can copy these into notes if desired.



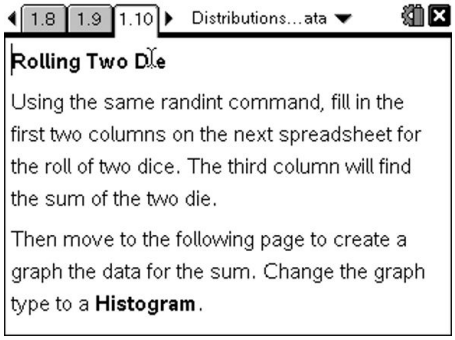
The first scenario provided on 1.5 and 1.6 is a set of class marks. Students will generate a histogram using the Quick Graph command in Lists and Spreadsheets and determine the type of distribution they have.



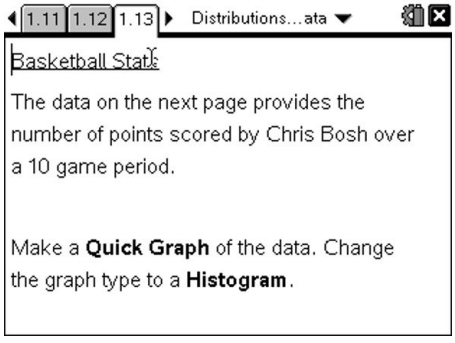
In the second scenario, students will simulate the rolling of a single die 300 times using the **randint** *command. Students will then create the histogram on the empty Data and Statistics page that follows their data.*
Note: Students can return to their Lists and Spreadsheets page and recalculate (CTRL + R) the data or increase the number of trials to observe the impact on the histogram. If they increase the number of trials, they will need to adjust their scale.



The scenario that follows builds naturally on the last one as students simulate the rolling of two die using the **randint** *command in two columns. The third column has been set up to determine the sum of the first two columns. Students will then create the histogram on the empty Data and Statistics page that follows their data.*
Note: There can be a discussion about the formula in the third column so students are aware of what it is doing. Students can return to their Lists and Spreadsheets page and recalculate (CTRL + R) the data or increase the number of trials in the first two columns to observe the impact on the histogram. If they increase the number of trials, they will need to adjust their scale.



The final scenario is a set of data provided that students will generate a histogram for using the Quick Graph command in Lists and Spreadsheets and then determine the type of distribution.



Assessment and evaluation

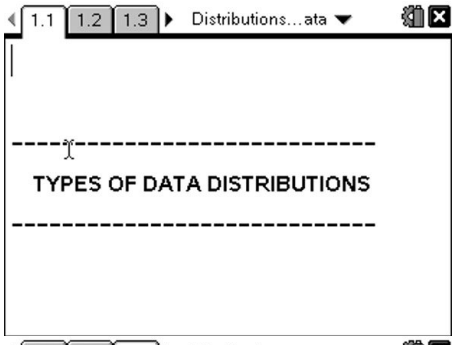
- *The entire activity can be used as a formative assessment after students have been introduced to the data distributions.*
- *The data distributions for each scenario are in the following order: skewed right; uniform; normal; skewed left.*

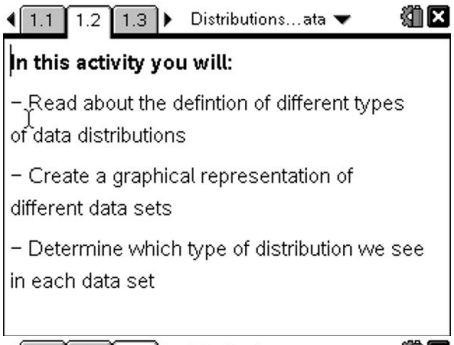
Activity extensions

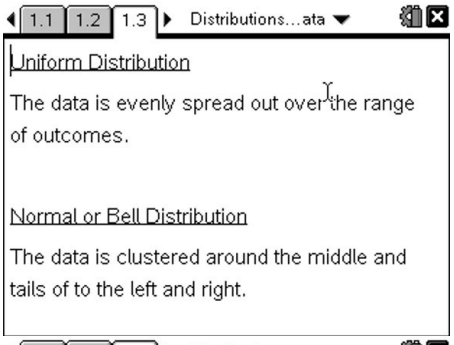
- *Students can explore other possible scenarios in everyday applications that will have the distributions explored in the activity.*
- *For the scenario of rolling two dice, students can explore the outcomes and distribution of rolling three dice.*
- *Connections to experimental and theoretical probability can be explored by looking at larger numbers of trials and seeing how many are required for the experimental probability to start approaching the theoretical probability.*

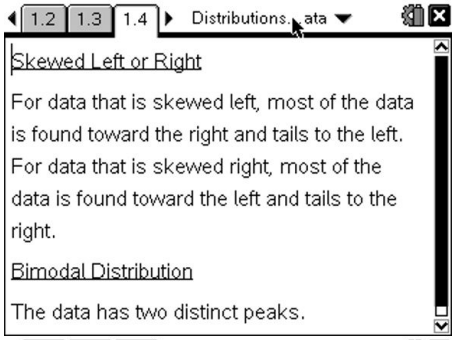
Student TI-Nspire Document

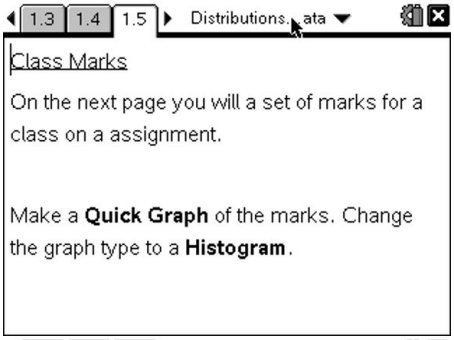
Distributions of Data

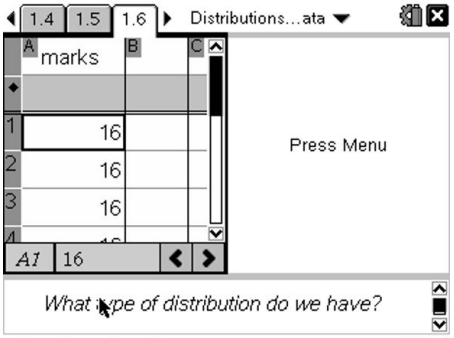


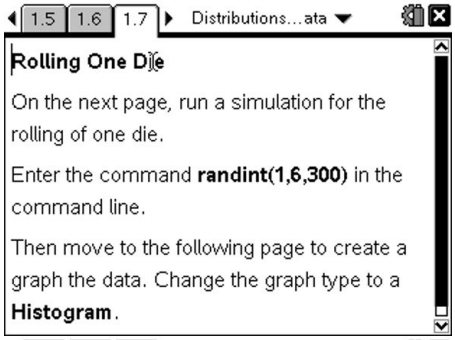


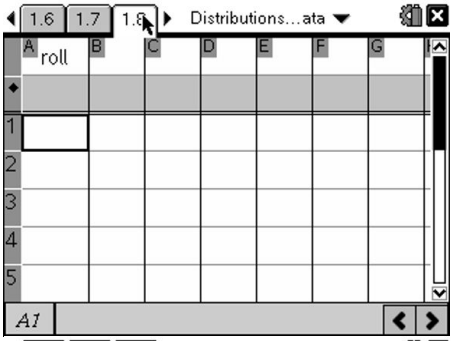


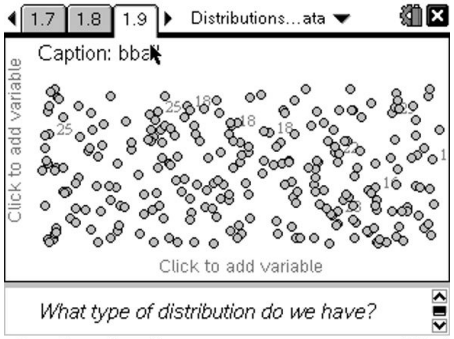


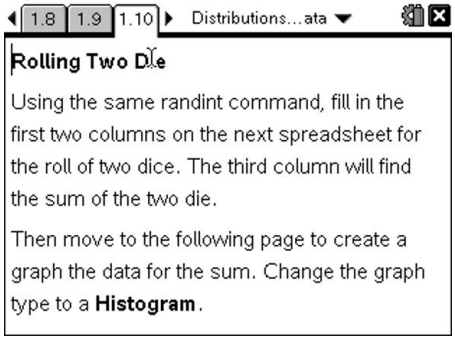


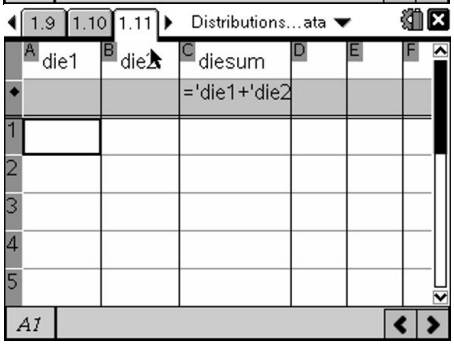


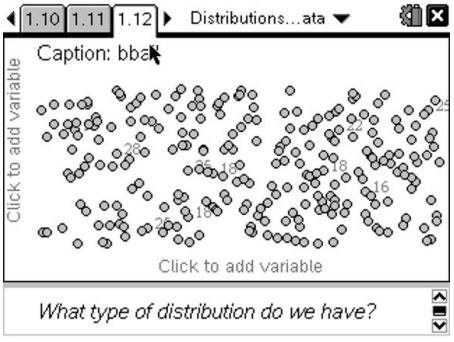


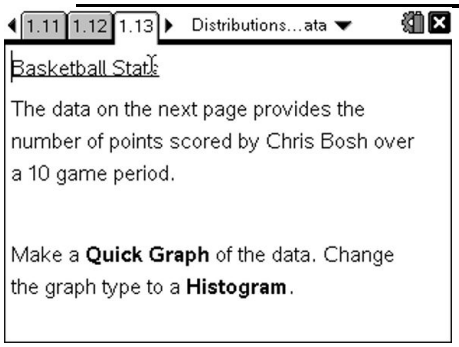


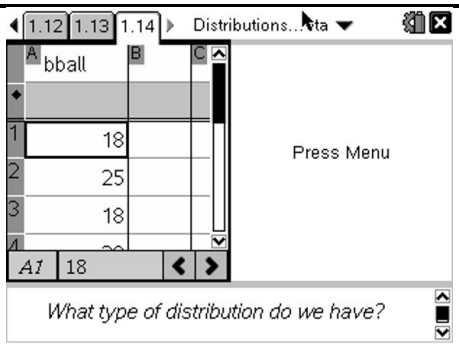









1.11 1.12 1.13 Distributions...ata
Basketball Stats
The data on the next page provides the number of points scored by Chris Bosh over a 10 game period.
Make a **Quick Graph** of the data. Change the graph type to a **Histogram**.


1.12 1.13 1.14 Distributions...ata
A bball
B
C
1 18
2 25
3 18
A1 18
Press Menu
What type of distribution do we have?