Collecting Calvin's Trinkets		
This activity is based upon a comic strip. Source: Watterson, Bill. *The Essential Calvin and Hobbes,* ©1988, page 178.		
Description	**Instructor Notes**	**Slides/Handouts/Files**
This activity simulated the purchase of cereal boxes in order to get a "complete set of all ten colors" of plastic trinkets. Students will record data in a tally chart in order to find the number of boxes purchased in each instance of successful completion of a set. Collecting and analyzing class results will allow them to examine descriptive statistics like range, minimum, maximum, and mean.	Students will use the **randInt** function in order to generate random numbers from 1 to 10. After completing one set of ten colors, they will use the ⎣LIST⎦ feature of the calculator to "purchase" several sets of 50 boxes. When each student has several data points, they will enter the class data into a collective list. This will allow students to arrive at an experimental answer to the question of how many boxes much be purchased. The theoretical value for the answer is computed as a hypergeometric distribution. One important concept for students to understand is the reciprocal relationship between the probability of rolling a particular number with a die, and the number of rolls expected to do so. In other words, since $P(4) = 1/6$ when rolling a standard die, we would expect it will take about 6 rolls on average to actually roll a 4. On a previous day, students might complete a warm-up activity to experimentally verify this reciprocal for themselves.	1) Calvin's Trinkets Handout 2) Data Summary Sheet

Participant Discussion

1. What are some situations where simulations are helpful?
2. Can you think of other ways to model this situation, either with manipulatives or by a different calculator function?
3. How closely did the original class "guestimate" match with the experimental result achieved by the simulation with random integers and the theoretical value calculated by adding the fractional values?
4. What new mathematical connections occurred for you as you worked on this problem with your classmates?

Calculator Functions

Students will use the randInt function to generate random numbers. They will store data in lists and examine descriptive statistics for the data. It may be important to "seed" the random number generator before students begin their data gathering. Students will use the TI-73 fraction addition feature in order to calculate their final theoretical answer to the "how many boxes" question.