2013 T³ International Conference
Philadelphia, PA

Using Multiple Representations With the TI-10/TI-15 to Build New Understandings in Elementary Mathematics

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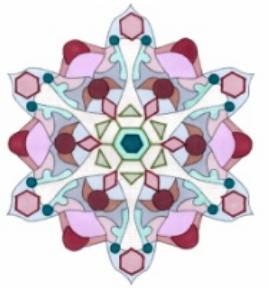
http://education.ti.com/en/us/activities/explorations-series-books/activitybooks

Zowie - Plastic Ants
http://www.amazon.com/Package-144-Plastic-Picnic-Ants/dp/B000HJ9RBM



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Teaching and Learning Joint Conference and T³ Regional

Common Core State Standards for Mathematics K-12

June 10-11, 2013

Sheraton Music City, Nashville, TN

The Teaching and Learning Joint Conference is designed to empower teachers with knowledge and understanding of Common Core State Standards of Mathematics and provide rich tasks to take back to the classroom and use as foundational lessons as they implement the CCSSM.

Attendees can count on networking with teachers from across the region, learning from experienced educators and participating in hands-on and demonstration sessions for new and experienced educators. You'll receive lots of great classroom activities and ideas, along with the latest news on TI technology.

Keynote Speaker - Dr. R. Lynn Canady,

Professor Emeritus and former Chair, Department of Leadership, Foundations and Policy Studies, University of Virginia

Dr. Canady has taught in grades 4 through 12 and has served as principal of elementary, middle and junior high schools in Tennessee and Kentucky. He has received numerous awards for outstanding teaching and service. In addition to publishing over 25 articles in educational journals, he has served as the general co- editor of seven books relative to teaching strategies designed for block schedules.

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Using Multiple Representations with the TI-10 & TI-15 Explorer Calculators to Build New Understandings in Elementary Mathematics

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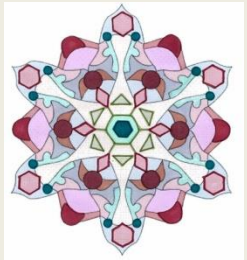

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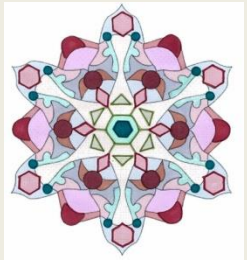
CCSSM

www.CoreStandards.org

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.



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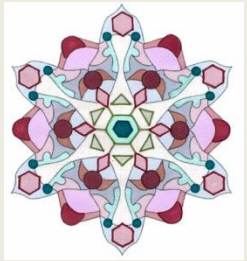
The SMP…

…describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years.



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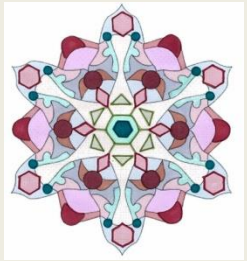
So…

Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.



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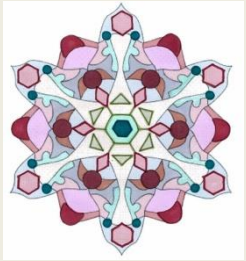
Activities are available free…

http://education.ti.com/en/us/activities/explorations-series-books/activitybooks



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This Activity…

Uncovering Math with Manipulatives, the TI-10, and the TI-15 Explorer: 100 or Bust

http://education.ti.com/calculators/downloads/US/Activities/Detail?id=5350

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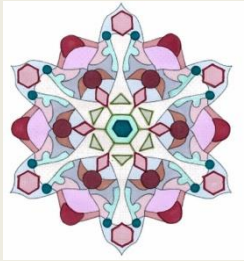
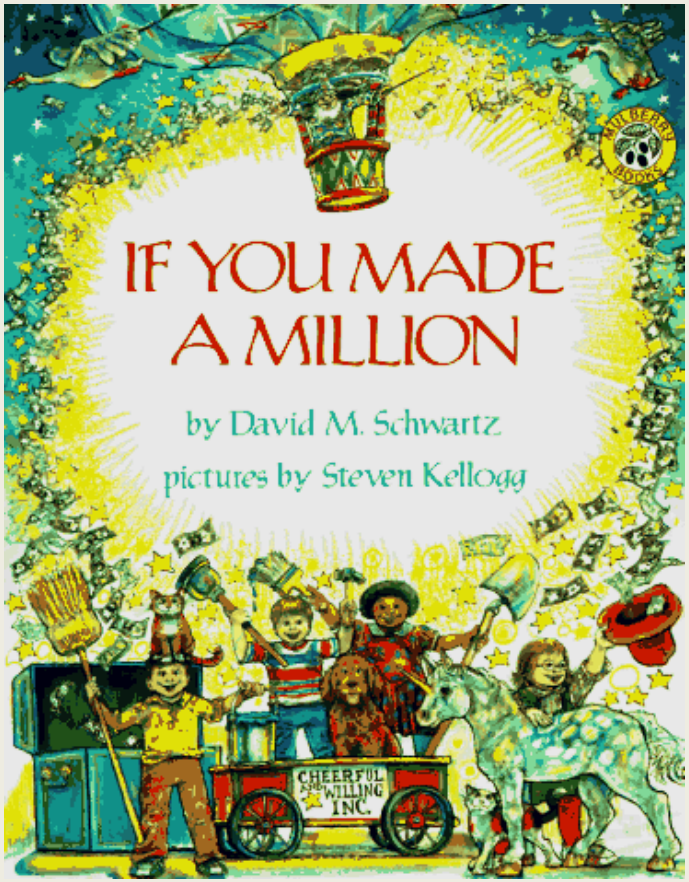


Connecting Mathematics & Literacy



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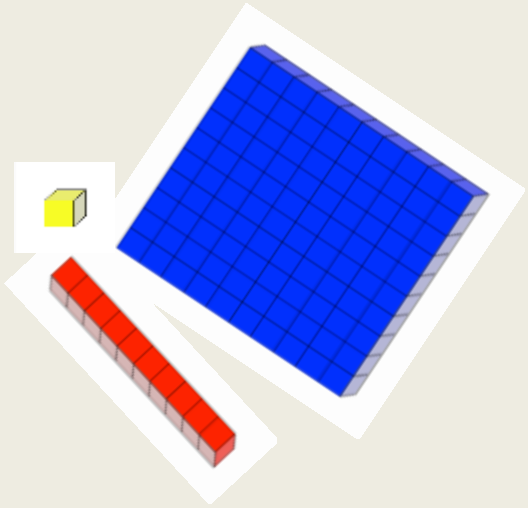
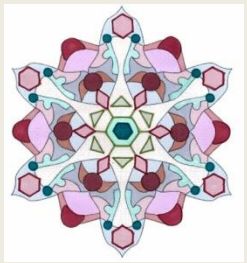
5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem.





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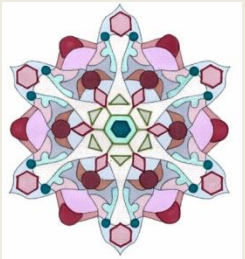
Task

Seven people have a total of exactly $100. Each person has either all $1 bills or all $10 bills. How much money could each person have?



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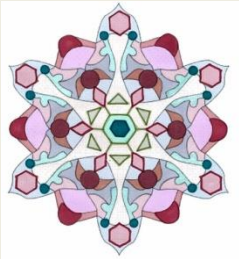
100 or Bust

- You will work in groups of three.
- Roll the number cube seven times.
- The result of each roll will represent either how many $1 bills or $10 bills someone in the group of seven people has.



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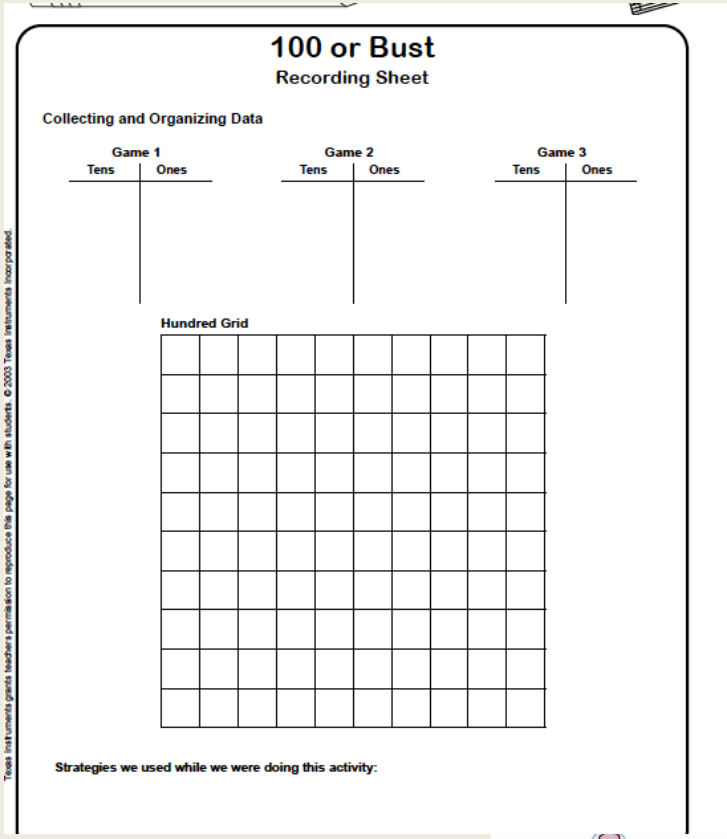
100 or Bust

The first student rolls the number cube. Based on the whole group's decision, he or she then records each of the resulting digits in the proper column on the place-value chart on the recording sheet.



100 or Bust

Recording Sheet

Collecting and Organizing Data

Game 1		Game 2		Game 3	
Tens	Ones	Tens	Ones	Tens	Ones

Hundred Grid

Strategies we used while we were doing this activity:

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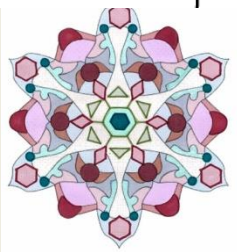

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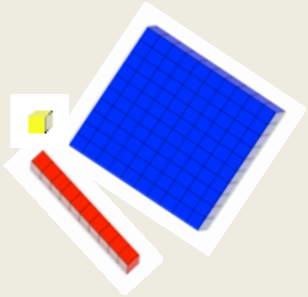
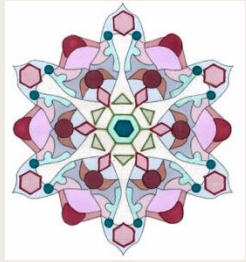
100 or Bust

- The second student uses place-value materials to represent the amounts on the hundred grid as they are written on the chart.





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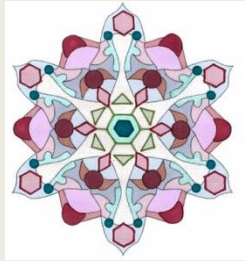
100 or Bust

- The third student uses the calculator to keep a total by adding the amount of each roll of the number cube.



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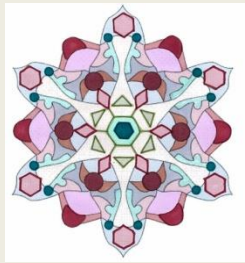
100 or Bust: The Rules

- Roll exactly seven times.
- Place (write) each digit rolled in either the ones or tens place (column) to make a sum $\leq$ 100.
- Record your group's thinking in the strategy area.



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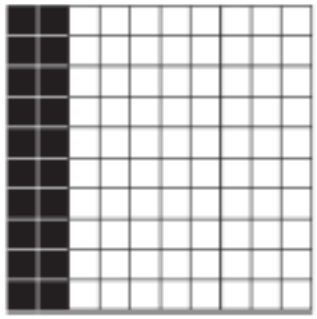
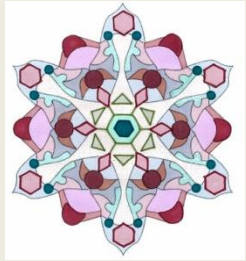
100 or Bust: An Example

The first student rolls a 2. The group decides to put the 2 in the “Tens” column. The first student writes 2 in the “Tens” column and 0 in the “Ones” column. The second student uses place-value materials to represent 20 on the hundred chart. The third student enters 20 in the calculator.

Tens	Ones
2	0





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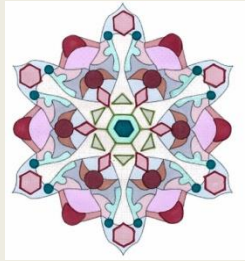
100 or Bust

Have students play the game at least three times, rotating the responsibilities each time, so that each student gets to work with each representation. Each time they play, students should look for strategies to play a better game.



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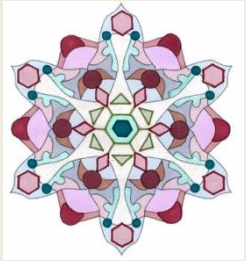
100 or Bust: Questions

- How did you decide to place this digit in the ones place? The tens place?
- How does your sum affect your strategy as you play?
- What if we changed the rules so that you could go over 100, or so that you could choose to either add or subtract the number that comes up on the number cube? Could you get closer to 100?



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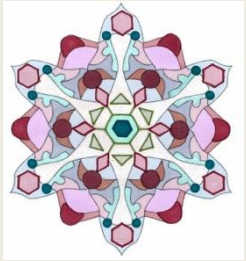
100 or Bust: Questions

- How did your strategies change within a game?
- How did your strategies change as you played more games?
- What does the recording sheet keep track of for you that the calculator doesn't?



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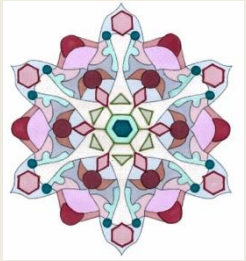
100 or Bust: Questions

- What do the place-value materials show that the calculator and recording sheet don't?
- What does the calculator help you do?
- How did you use the calculator to help you decide what to do next in the game?



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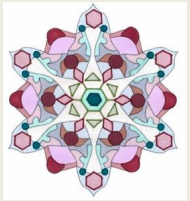
100 or Bust: Questions

- What if you did not have to roll exactly seven times?
- What if you could roll fewer times?
- What if you could roll more than seven times?
- How would your strategies change?



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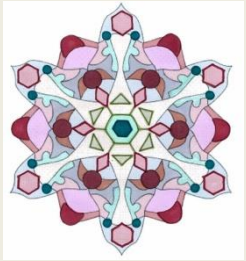
100 or Bust: Questions

- Is there any game that you played that could have made a sum of 100 if you rearranged the digits?
- Use your recording sheet and calculator to find out.



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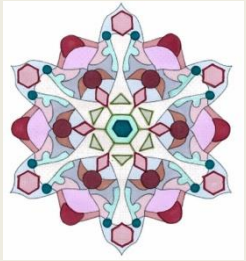
100 or Bust: Extensions

- Play the game with polyhedral dice other than cubes and see whether their strategies need to change.
- Find a set of seven rolls that would equal exactly 100.



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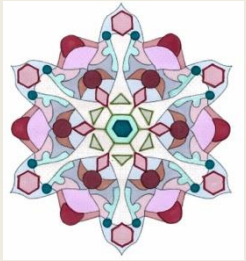
100 or Bust: Extensions

- Investigate how many sets of seven rolls they can find.
- Revise the game to include the 100s place and try to make a sum of 1000.
- For Kindergarten: Play “10 or Bust” and use a number cube with 1 -4, and roll fewer times.



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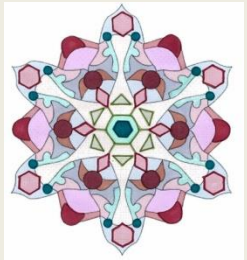

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