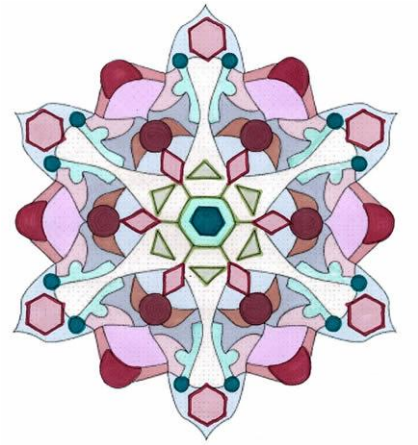
2012 NCTM Regional Conference

Dallas, TX

Session 132: Tools of Investigation for the Beginning Mathematician

Friday, October 12, 2012: 8:30 AM-10:00 AM *Room C140 (Convention Center)*



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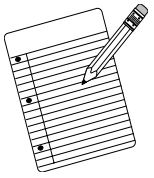


Patterns in Counting

Recording Sheet

Collecting and Organizing Data

Hundred Grid

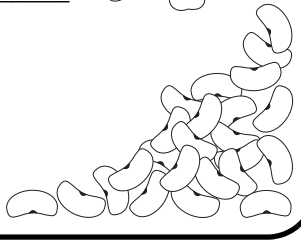
The number of beans (cubes) I think I can hold in one hand: _____

The number of beans (cubes) I actually held in one hand: _____

The number of beans (cubes) I think I can hold in two hands: _____

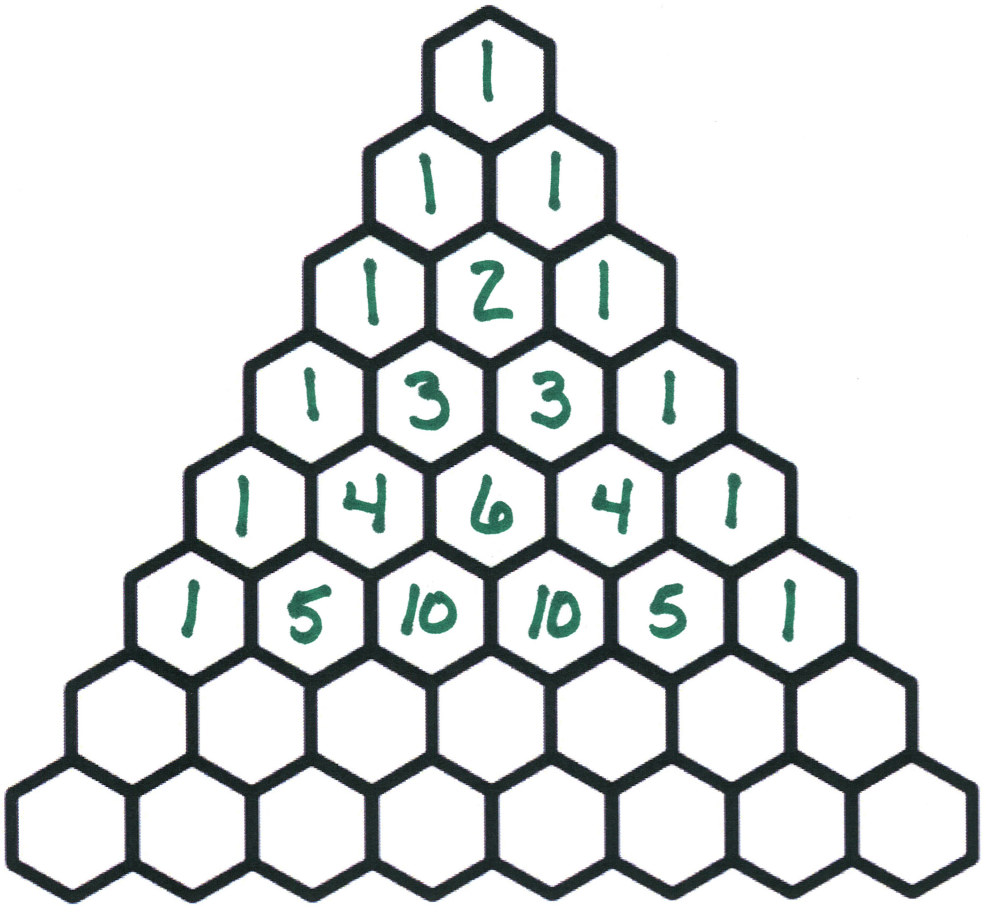
The number of beans (cubes) I actually held in two hands: _____

Questions we thought of while we were doing this activity:



50's Chart & Pascal's Triangle

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50



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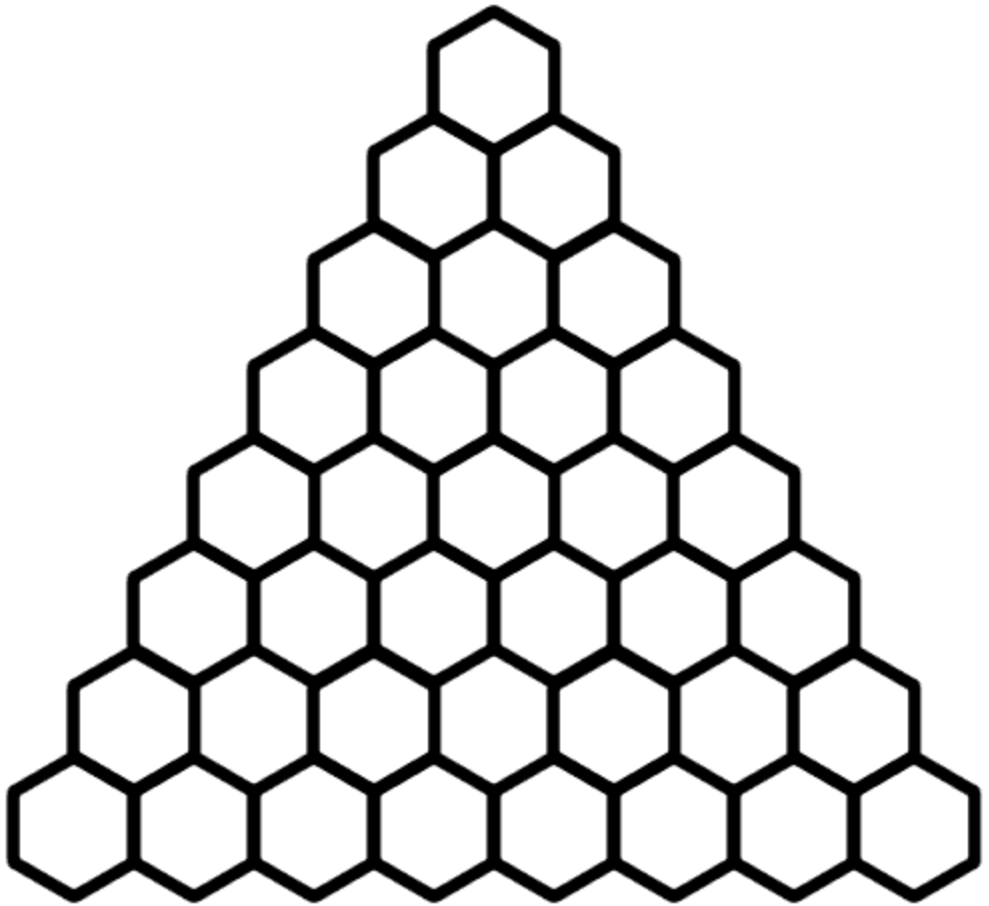
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50



Splitting Beans

NAME_____

1. Complete the table below. For the last row, make up your own problem to fit the pattern.

Number of Beans	Group Size	Number of Whole Groups	Number Left Over	Fraction of Group Left Over	Quotient with Calculator
25	3				
25	4				
25	6				
25					

2. Compare your results in Question 1.

(a) Why are the fractions different when the number of beans leftover is the same?

(b) Why are the decimal parts of the answers different?

3. Complete the table below. For the last row, make up your own problem so that six beans are leftover.

Number of Beans	Group Size	Number of Whole Groups	Number Left Over	Fraction of Group Left Over	Quotient with Calculator
11	3				
19	8				
27	10				
23	5				
25	7				
			6		

4. How are the fractions in Question 3 different from the fractions in Question 1?

5. Complete the table below. For the last row, make up your own problem to fit the pattern.

Number of Beans	Group Size	Number of Whole Groups	Number Left Over	Fraction of Group Left Over	Quotient with Calculator
16	6				
40	15				
24	9				

6. In Question 5, why are the quotients with the calculator the same, even though the numbers of beans leftover are different?

Extend Your Thinking. A decimal that ends is called a *terminating decimal*. How can you predict whether the calculator's answer will terminate? (Hint: It has to do with group size.)

Tools of Investigation for the Beginning Mathematician

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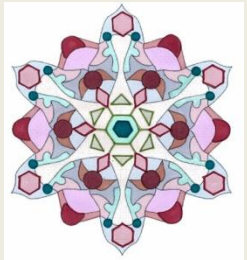
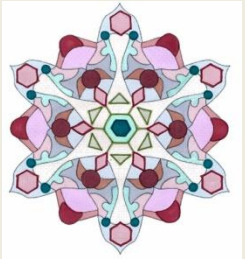


CCSSM

www.CoreStandards.org

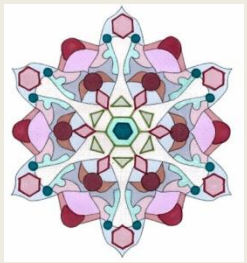
Mathematical Practices

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.



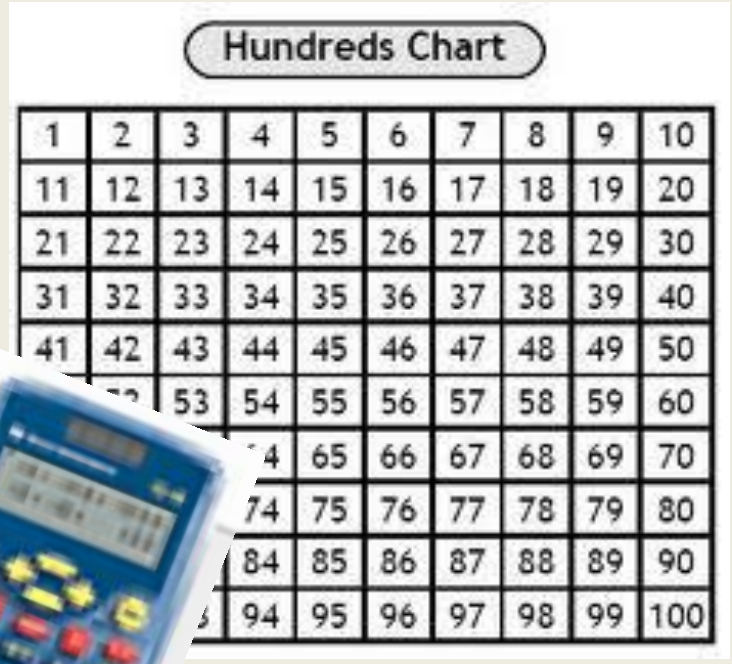
5. Use appropriate tools strategically.

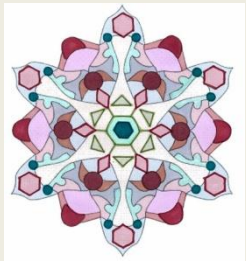
Mathematically proficient students consider the available tools when solving a mathematical problem.



5. Use appropriate tools strategically.

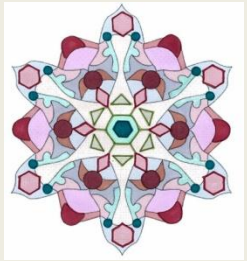
Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations.





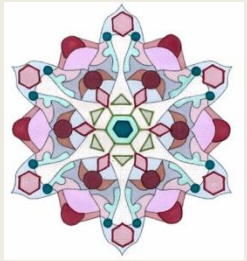
The SMP…

…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.



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.

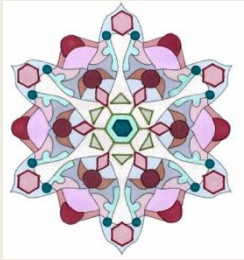


First Activity is available free…

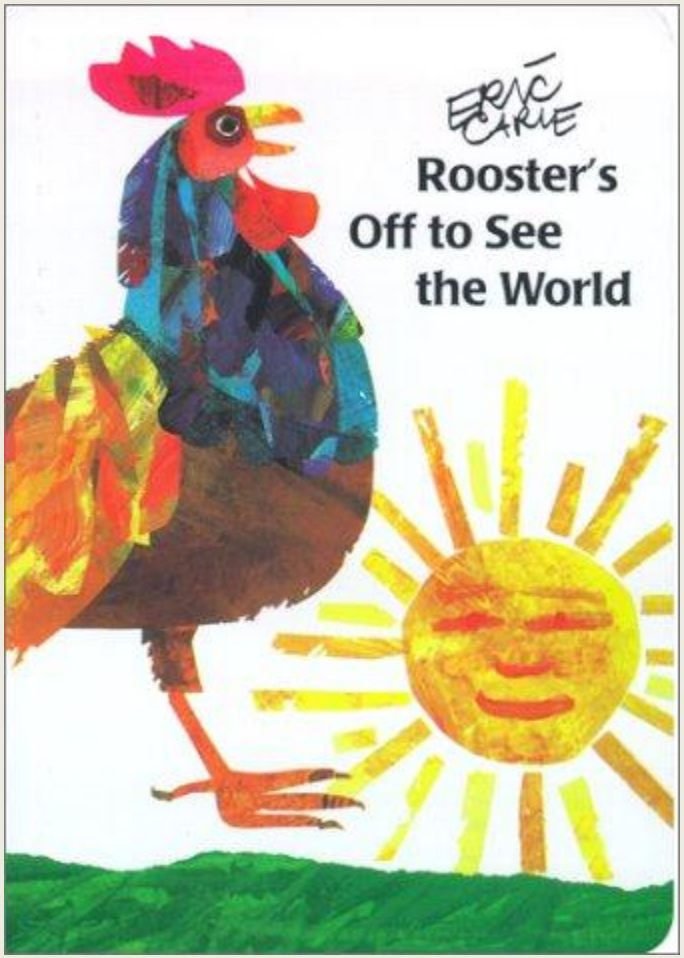
http://education.ti.com/

- *Patterns in Counting*
  Uncovering Math with Manipulatives and the TI-10
- *Extension: Patterns in Counting with Decimals*

Uncovering Math with Manipulatives, the TI-10, and the TI-15 Explorer



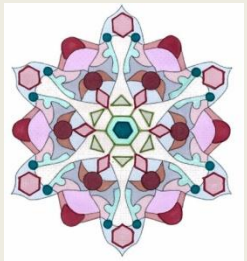
Connecting Mathematics & Literacy



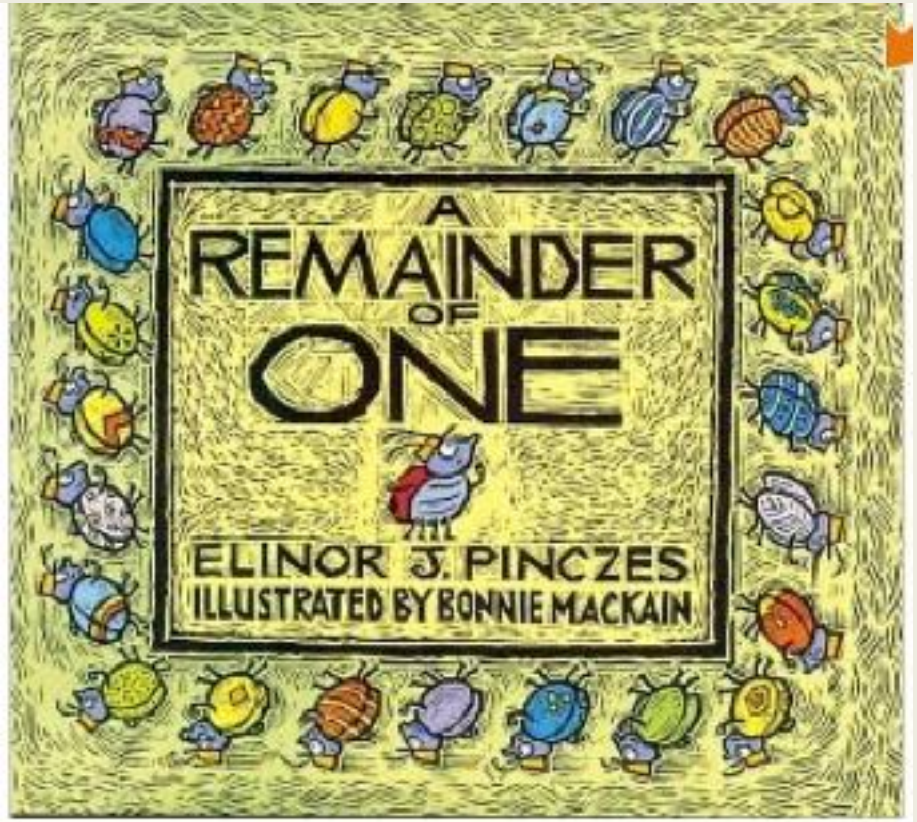
Second Activity is available free…

NCTM Illuminations:

http://illuminations.nctm.org/LessonDetail.aspx?id=L818



Mathematical Literacy



Q & A

The TI-10 and the TI-15: Tools of Investigation for the Beginning Mathematician

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