

9/3/2015 Thursday

Stretches

1. *Cutting the String!* A piece of string is 10 inches long. What is the smallest number of scissor cuts necessary to get 10 one-inch pieces?
2. *Earrings!* In a village of 800 people, 3% wear one earring. Of the remaining 97%, half wear two earrings and half wear none. How many earrings are worn?

Group work

3. *Two Bean Heaps.* Make two heaps of beans with 10 beans in each heap. You and a partner alternate moves until all the beans are gone. The winner is who takes the last bean(s). A move consists of removing one bean from one of the piles, or of removing a bean from each pile. What is a winning strategy?
4. *Cycling Heaps.* Start with a collection of several heaps of beans. We create a new collection of heaps by removing one bean from each original heap, and form a new heap out of the beans removed; i.e., each original heap shrinks by one, and you create a new heap consisting of the removed beans.
 - When is the new collection of heaps the same as the original collection of heaps; e.g., if you had heaps of 2, 3, and 3 beans, then after one move you will have heaps of 1, 2, 2, and 3 beans and therefore the new collection is not the same as the original.
 - Consider doing a bunch of these moves. Give an example of a collection such that after a certain amount of moves you end up with the original collection.