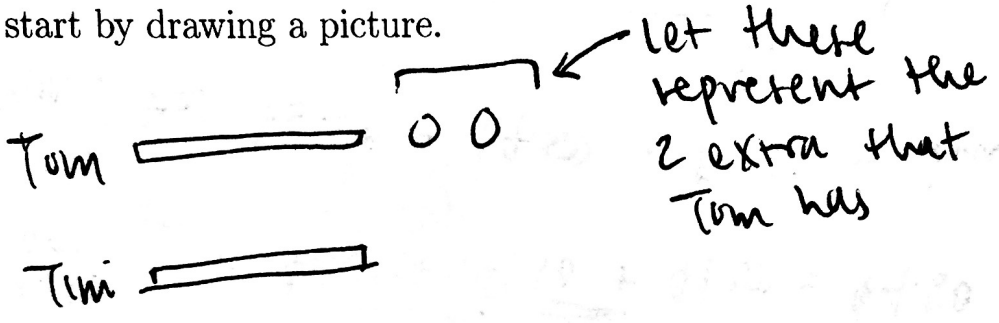
Early Elementary Week 7: Problem Solving

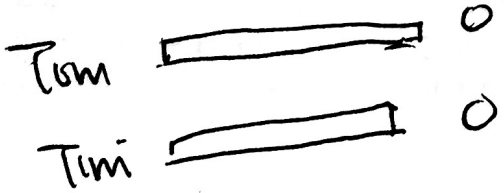
1. Tom and Tim are eating raisins. Tom has 2 more raisins than Tim. How many raisins should Tom give to Tim so they have the same number of raisins? Please start by drawing a picture.



Let these represent the 2 extra that Tom has

Let the bar represent the unknown amount of raisins that they both have

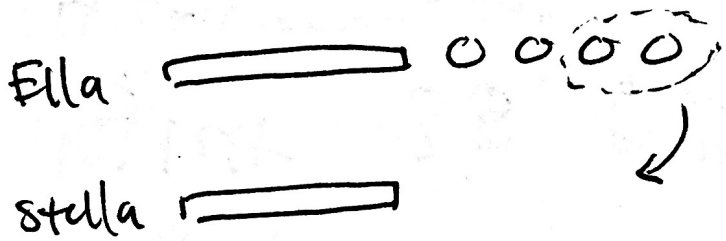
Then, it is clear that no matter how much the bar represents, Tom must move 1 raisin over so they have the same amount.



1 raisin

Note that this is one half of the extra that Tom had.

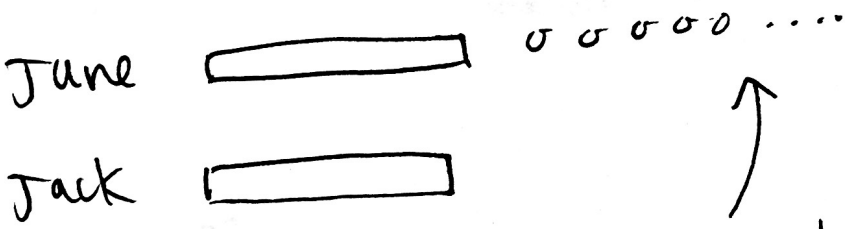
2. Ella has 4 more raisins than Stella. How many raisins should Ella give to Stella so that they have the same number of raisins? Please start by drawing a picture.



2 raisins

Note that this is one half of the 4 extra that Ella had.

3. Jane has 100 more stamps than Jack. How many stamps should Jane give to Jack so that they have the same number of stamps?



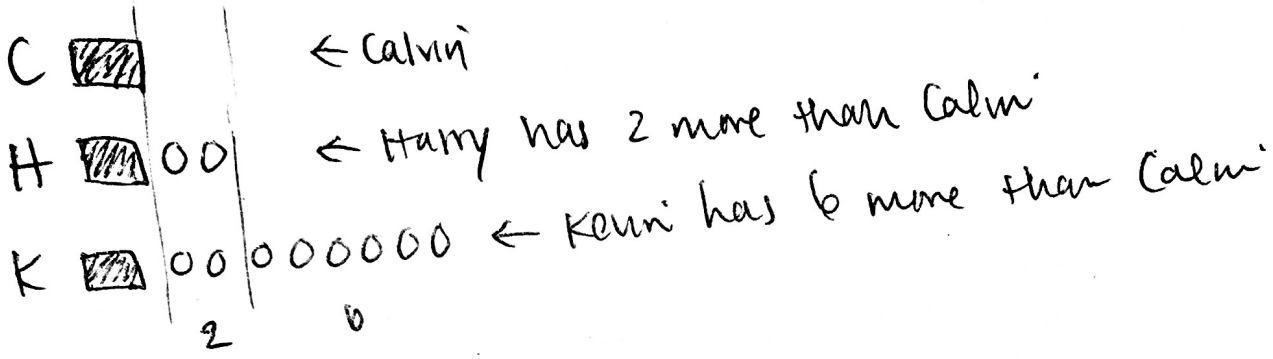
The excess now becomes too much to draw. However, from the pattern in problems 1 & 2, the person with more must take ½ of the excess amount and give it to the other. This is called "splitting the difference."

Then, $100 \div 2 = 50$

Jane gives Jack 50 raisins.

4. Kevin has 6 more apples than Harry, and Harry has 2 more apples than Calvin. How many apples should Kevin give Calvin so Kevin and Calvin have the same number of apples? (Hint: First find out how many more apples Kevin has than Calvin has.)

Work backwards → use a [▨] to represent Calvin, then add.



Alternatively, $2+6=8$
Kevin has 8 more than Calvin.

Split the difference — $\frac{8}{2} = 4$

4 apples

5. Thomas goes to the store with \$1.00. If Thomas can buy 4 pears, and have no money left over, how much does each pear cost?

25¢

6. Calvin goes to the store with \$5.00. Each kiwi is \$0.50. He buys 4 kiwis. He can buy 3 papayas with the remaining money and have no money left over.

(a) How much money did he spend on kiwis?

0.50 + 0.50 + 0.50 + 0.50

= \$2.00

(b) How much does each papaya cost?

\$5.00 − \$2.00 = \$3.00 ← total \$ spent on papayas

\$3.00 ÷ 3 = \$1.00 each

↑ # papayas

7. Anna has \$5.00 in total. An orange is \$2.00 each, and an apple is \$0.50 each. Anna purchases 2 oranges.

(a) How much money did Anna spend on oranges?

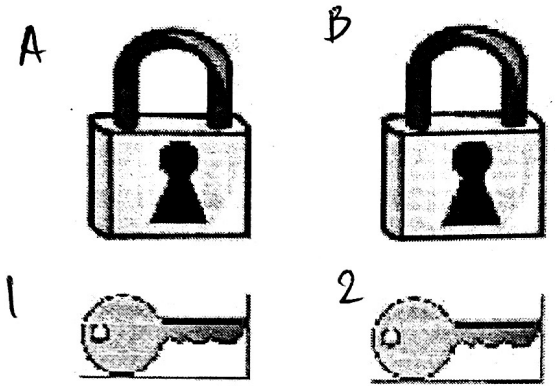
2.00 + 2.00 = \$4

(b) After Anna buys the oranges, how many apples at most can she buy with the remainder of her money?

\$5 - \$4 = \$1

2 apples

8. There are 2 different keys that open 2 different locks. You want to find out which key opens which lock. Each key opens exactly one of the locks. On each trial, you insert one key into one of the locks and see if it works or not. How many trials do you need to match the keys with the locks?



Look at "worst case scenario" for [redacted] # of trials needed.

[redacted]

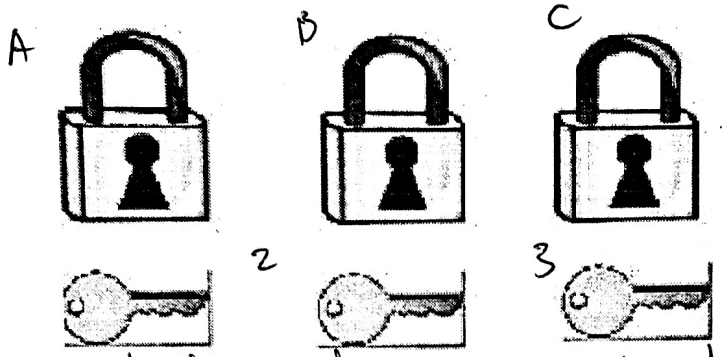
Try #1: Try key 1 in Lock A

- If it works, 1A and 2B
- If it doesn't, 1B and 2A

either way, only need 1 try to find which key goes into which lock.

1 trial

9. There are 3 different keys that open 3 different locks. Each key opens exactly one of the locks. How many trials do you need to match the keys with the locks? Think about how this problem is related to the previous one.



First, try to find the matching lock for key 1

Try #1: Try Key 1 in Lock A

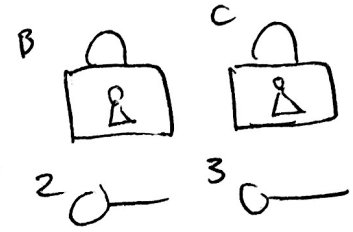
- if it works, 1A ... but you want to find the necessary # of trials needed. Assume it does not work to achieve this.

if does not work, keep trying

Try #2: Try Key 1 in Lock B

if does not work, then 1C

Then the problem simplifies to



which was solved on the previous page for just 1 try.

Thus, total # of tries = **8 tries**