# The Children (solution)

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This is a logic puzzle. Using the given rules, we can deduce the order in which the snacks were served, and which children have eaten from which platter.

**Deductions**

a. From rule 2, we can calculate that 14 love letters (hereafter abbreviated LL) and 14 pineapple tarts (hereafter abbreviated PT) in total.
b. From rule 6, we can deduce that the 5 alphabetically later children (hereafter, children will be referred to by their initials), G to K, ate 9 LLs and 3 PTs while A to F ate 4 LLs and 10 PTs.
c. Next, we can use rule 3 to figure out the distribution of snacks among the plates.
    - Since powers of 2 are excluded, the only prime numbers allowed are the odd ones.
    - It is not possible for there to be 1 platter of one type of snack and 5 platters of the other. The one platter would have to have 14, which is non-prime, meaning that there has to be 4 primes other than 2, and 1 non-prime which sum to 14, which is impossible.
    - Consider the case where one type of snack has 2 platters and one type has 4 platters. The type with 2 platters cannot possibly be both even, as the only even numbers under 14 that are not powers of 2 are 6 and 10. That implies they are both odd. However, since there must be at least one even platter, that implies that there are 2 even platters on the type with 4 platters. The only valid distribution is 1/1/6/6, which leaves no room for 4 primes.
    - Therefore, the platters must be split such that there are 3 platters of each type. The only way to achieve this split following the rules is for each type to be split such that there are 3, 5 and 6 snacks on the platters of that type.
d. Using rules 10 and 11, we know that anyone other than A, E, F and K could not have eaten from the 4th platter (otherwise they would also have to eat from the 5th, which is consecutive).
e. Consider rules 7, 8, and 11 to figure out how much J ate. J did not eat from the first 2 platters, and also did not eat from consecutive plates, so could not have eaten 3 snacks. Since only B and Ivan ate 2 snacks, J must have eaten 1 snack.
f. From rule 4 and (e), we know that D also ate only 1 snack.
g. Consider rule 9, if E ate 5 snacks, then she would have to eat from the last platter, contradicting rule 5. If E ate 3 snacks, then only 3 children in total ate 3 snacks, and even if everyone else ate 2 snacks (which we already know not to be the case), the total would be (3 * 3) + (2 * 8) = 25 which is less than 28. So we know E ate 4 snacks. We also know that E ate from platters 1, 2, 4, and 5 since she didn't eat from the last platter (rule 5). This fully determines E.
h. From (g) we now know that there are 3 children who ate 4 snacks. From rule 8 we know that 2 children ate 2 snacks. There are 28 - (3 * 4) - (2 * 2) = 12 snacks remaining. These went to the other 6 children, so the split must be 3 who ate 3 snacks, and 3 who ate 1 snack.
i. Anyone who ate 4 snacks must have eaten from consecutive plates, so we know that only A, E, F or K could have eaten 4 snacks.
j. Consider H. From rule 5 we know that H ate from at least the first and last platters, and from (i) and rule 8, we know that H must have eaten from 3 platters. Together with (d), we can work out that she ate from platters 1, 3 and 6. This fully determines

H.

k. We can fully determine which platters Ivan ate from – platters 1 and 3, since we know Ivan ate 2 platters, but not from the fifth platter (rule 7), the last platter (rule 5), the fourth platter (d), or consecutive platters (rule 11).

l. We can now figure out the snacks on some specific platters. Consider rule 12 together with (i). We know that 5 children ate both types of snacks. All 3 children who ate 4 snacks (we already know E is one of them) must have eaten both types, and so did B and K, so there's 2 possibilities here:
   - If K ate 3 snacks, then A and F are the other two who ate 4 snacks, and we know that A, B, E, F, and K were the ones who ate both types of snacks.
   - K ate 4 snacks, so only one of A or F also ate 4 snacks (and hence both types), and the ones who ate 4 snacks are B, E, K, one of A/F, and one other child.

   This means that at most one other child could have eaten both types. Now consider Helen and Ivan. We know which plates they ate from (1,3,6 for Helen, 1,3 for Ivan). This means that if Ivan ate both types of snacks, so did Helen, which is impossible. Therefore, Ivan ate only one type of snack. This must have been LLs, because we know from (b) that the children G to K ate only 3 PTs in total and since platters 1 and 3 contain the same snacks and both Helen and Ivan ate from them, they must both contain LLs.

m. From rule 3, we know that platter 3 has an even number of LLs, which must be 6. Platter 1 hence has either 3 or 5 LLs. From rule 7, since 10 children ate from at least one of the first two platters, and no platter has more than 6 snacks (from (c)), we know that platter 1 has 5 LLs.

n. To take (m) even further, we know from (g) that E ate from both platters 1 and 2, therefore the total number of snacks on platters 1 and 2 is 11 (with E eating from both, and the 9 children other than J eating from one of them). Platter 2 must thus have 6 PTs.

o. We've already identified that platters 2 and 3 had 6 snacks, platter 1 has 5 snacks, and platter 6 has 3 snacks (rule 5). Rule 10 implies that the number of snacks on the 5th platter is at least the number of snacks on the 4th platter. Hence, platter 4 contains 3 snacks and platter 5 contains 5 snacks. We now know how many snacks there are on each platter. We also know that platter 5 contains PTs since platter 1 has 5 LLs.

p. We can now deduce what platter 6 contains. Recall that we need the children G to K to eat 9 LLs. We know from (l) that Ivan ate 2 LLs and H ate at least 2 LLs, possibly 3, if the last platter also contained LLs. Also, J ate only 1 snack from (e).
   - Platter 6 and 4 contain 3 snacks, so whichever type is on platter 6, platter 4 has the other type.
   - If platter 6 contains PTs, then H is the final child (see discussion in (l)) to eat both types. But if that were so, we would need G, J and K to eat 5 LLs between them to make 9. Since the LLs would be on platters 1, 3, and 4, G cannot eat 3 LLs (rule 11), and J eats at most 1 snack, so K would need to eat 3 LLs. But that would imply that K needs to eat from platters 1, 3, and 4, and by rule 10, K also has to eat from platters 2 and 5, which causes a contradiction as that would make K eat 5 snacks in total.
   - Therefore, platter 6 contains LLs, and platter 4 contains PTs. We now know the amount and type of snack on each of the 6 platters.

q. We still need G to eat 3 love letters, because if G ate only 1, then K needs to eat 3, which means K would have to eat from the last platter, but by rule 5, would cause a contradiction because K would only be able to eat 3 snacks, and can't eat both types. So we know that G ate from platters 1, 3 and 6, fully determining G.

r. Knowing how many snacks G, H, I and J ate (3 + 3 + 2 + 1), we can determine that K ate 12 - 3 - 3 - 2 - 1 = 3 snacks. Therefore from (i), A and F ate 4 snacks.

s. Since 8 LLs were eaten between G, H, and I, K had to have eaten the last one to eat both types, so J ate a PT from platter 5 and is fully determined, and hence D also ate a PT (rule 4).

t. With G, H, I and J fully determined, we know K ate 2 PTs and 1 LL. K didn't eat from platter 4 (rule 10), ate from consecutive platters, not from the last platter, and couldn't have eaten from both the first and second platters (deduction (n)), so K ate from platters 2, 3, and 5.

u. A and F who ate 4 snacks also cannot eat from both the first and second platters (deduction (n)), and they didn't eat from the last platter (rule 5), so they must have eaten from platters 3 to 5, which also implies the platter 2 by rule 10. They are now fully determined.

v. B ate an LL from platter 6 (rule 5), didn't eat from consecutive platters, and must eat exactly 1 more tart (rules 8 and 12), so the only option is the second platter. B is now fully determined.

w. There's only 1 more PT left to be eaten on the second platter, which goes to D, who ate 1 PT (deduction (s)). Therefore by elimination, C ate an LL.

| Platter # | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Type of snack | Love Letter | Pineapple Tart | Love Letter | Pineapple Tart | Pineapple Tart | Love Letter |
| Alfred | x | y | y | y | y | x |
| Bernard | x | y | x | x | x | y |
| Cheryl | y | x | x | x | x | x |
| Diana | x | y | x | x | x | x |
| Eloise | y | y | x | y | y | x |
| Fred | x | y | y | y | y | x |
| Gemma | y | x | y | x | x | y |
| Helen | y | x | y | x | x | y |
| Ivan | y | x | y | x | x | x |
| Jean | x | x | x | x | y | x |
| Kai Kai | x | y | y | x | y | x |
| Total number of snacks | 5 | 6 | 6 | 3 | 5 | 3 |

The images of the snacks and the final line "At the end, the children thanked Ah Ma for the delicious **morsels** of food" hints that the Morse code should be considered for extraction. As clued by the shapes of the snacks in the images, love letters represent Morse dashes and pineapple tarts represent Morse dots.

Converting what each child ate into dots and dashes, in the sequence the snacks were eaten, and decoding the Morse code produces a letter for each child. Reading the letters in alphabetical order of the childrens' names gives the answer **LATE-BLOOMER**.